

REPORT
OF THE
MINISTER OF AGRICULTURE
FOR THE
DOMINION OF CANADA
FOR THE YEAR ENDING MARCH 31
1915

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OTTAWA

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REPORT

OF THE

MINISTER OF AGRICULTURE

1914-15

To Field Marshal His Royal Highness Prince Arthur William Patrick Albert, Duke of Connaught and of Strathearn, K.G., K.T., K.P., etc., etc., etc., Governor General and Commander in Chief of the Dominion of Canada.

MAY IT PLEASE YOUR ROYAL HIGHNESS:

I have the honour to submit to Your Royal Highness a report of the Department of Agriculture for the fiscal year ending March 31, 1915.

I. GENERAL REMARKS.

The work of the department has been carried on efficiently, and a synopsis of the operations of the various branches comprised therein is laid before Your Royal Highness under their respective headings.

The legislation affecting the department during this period consisted of:—

Chapter 7, 4-5 George V, intituled “An Act to regulate the Manufacture and Sale of Dairy Products and to prohibit the Manufacture or Sale of Butter Substitutes.” (Assented to May 27, 1914.)

Chapter 22, 4-5 George V, intituled “An Act to regulate Cold Storage Warehouses.” (Assented to June 12, 1914.)

The Right Honourable the Secretary of State for the Colonies forwarded under a circular letter, dated the 10th November, 1914, an order issued by the Board of Agriculture and Fisheries, relative to the importation of dogs into Great Britain from abroad. This order will be found as an appendix hereto. (See appendix No. 19.)

By an Order in Council of date the 17th day of April, 1914, the regulations under “The Meat and Canned Foods Act,” established by Order in Council of the 1st of August, 1910, and amended by Order in Council of the 12th of November, 1910, were further amended by expunging the following part of section 12 thereof relating to tapeworm cysts:—

“Tapeworm Cysts: *Cysticercus bovis*, *Cysticercus cellulosæ*, except when the infestation is slight, in which case the carcass may be rejected and rendered into lard or tallow,”

and substituting therefor the following:—

“Tapeworm Cysts: *Cysticercus cellulosæ*, except when the infestation is slight, in which case the carcass may be rejected and rendered into lard.

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Cysticercus bovis, except when the infestation is slight, in which case the carcass may be rejected and rendered into tallow.

"In carcasses where the infestation is slight, and confined to the head and heart, the carcass, after the removal and condemnation of the affected parts, if properly identified by 'Held' tags, and kept in cold storage or pickle for twenty-one days, may upon re-inspection, if found otherwise fit for food, be passed and marked as required by the regulations.

"*Cysticercus ovis*, except when the infestation is slight, in which case the carcass may be rejected and rendered into tallow.

"In carcasses where the infestation is slight and confined to the head and heart, the carcass, after the removal and condemnation of the affected parts, if properly identified by 'Held' tags, and kept in cold storage or pickle for twenty-one days, may upon re-inspection, if found otherwise fit for food, be passed and marked as required by the regulations."

Vide Canada Gazette, vol. xlvii, p. 3761.

By an Order in Council of date the 18th day of May, 1914, the following regulations relating to tuberculosis were made and established for the purpose of ensuring a pure and wholesome milk supply for the inhabitants of many cities and towns of Canada, and especially to prevent the sale of milk from tuberculous cows:—

REGULATIONS RELATING TO TUBERCULOSIS.

1. The aid of the Department of Agriculture, as aforesaid, will be given to such cities or towns having a population of not less than five thousand persons as shall have secured the necessary provisions under provincial legislative authority for the purpose of agreeing to the present regulations.

2. The Government of Canada will assist any city or town, which shall have signified in writing to the Veterinary Director General its desire to have the aid of the Department of Agriculture in controlling bovine tuberculosis in the cows supplying milk and cream to the said city or town, provided the said city or town shall have stated in its application for the aid of the Department of Agriculture, as aforesaid, that, being thereunto duly empowered by law, it will undertake and provide that:—

(a) Dairies in which milk or cream are produced for sale therein shall be licensed.

(b) No license shall be issued unless the dairy conforms to the required standard.

(c) The standard shall require that the stable shall have an ample amount of air space, and at least two square feet of window glass for each cow, and shall be well ventilated, drained, and kept clean and sanitary.

(d) After two years from the date of the first test of the cattle of any dairy, the sale within the said town or city, of milk or cream from any herd shall be prohibited unless the said herd shows a clean bill of health from the Veterinary Inspector.

(e) An inspector or inspectors shall be appointed and paid by the said city or town, whose duty it shall be to see that the undertakings and provisions, as aforesaid, are carried out, and that the cows are kept clean and properly fed and cared for.

The Veterinary Director General on receiving notice in writing, from any such municipality of its desire to have the assistance of the Department of Agriculture, as aforesaid, shall forthwith make inquiry, and if satisfied that the foregoing requirements are being carried out shall send Veterinary Inspectors to inspect the said cows.

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4. Veterinary inspectors shall use the tuberculin test and also make a careful physical examination of the cows, in order to determine whether they are healthy or not. Dairy bulls shall also be examined and subsequently treated in the same way as cows.

5. Following the examination and test the diseased cows and reactors shall be dealt with as follows:—

(a) Cows which in the opinion of the inspector are affected with open tuberculosis and are distributing the germs of the disease through the milk, faeces or sputum, shall be sent to an abattoir under inspection and there slaughtered as soon as conveniently can be done. When no such abattoir is within reasonable distance, the cows shall be slaughtered in the presence of the inspector, who shall direct how the carcass shall be disposed of.

(b) Reactors to the test shall be separated from non-reactors as effectively as possible (suspicious animals shall be classed as reactors), and the owner shall be given the choice of disposing of them in one of the following ways:—

(1) Immediate slaughter.

(2) Slaughter after they have been prepared for the block, by drying off and feeding.

(3) Retaining them in the herd, and selling no milk or cream until it has been pasteurized.

6. Compensation shall be paid to the owner of the herd for all cows slaughtered under these regulations upon the following basis:—

(1) One-half the appraised value of the cow if destroyed as a case of open tuberculosis.

(2) One-third the appraised value of the cow if destroyed as a reactor at the request of the owner.

(3) Valuation shall be made by the inspector, and shall not exceed the maximum valuation for cattle as specified in section 6 of the Act.

7. The salvage from the carcass shall be paid to the owner of the cow in addition to the compensation, provided compensation and salvage together amount to less than the appraised value; if more, the surplus shall be paid to the Receiver General.

8. No compensation shall be paid to the owner unless, in the opinion of the minister, he assists as far as possible in the eradication of the disease by following the instructions of the inspector as to disinfection, etc.

9. No milk or cream shall be sold from a herd containing reactors unless such milk and cream are properly pasteurized. The inspectors of the municipality shall see that this provision is effectively carried out.

10. Tests and examinations of the herds shall be made whenever deemed necessary by the Veterinary Director General, and after each test and examination the herd shall be dealt with in the manner aforesaid.

11. All cows bought by the owner of a herd while under control, shall be submitted to the test and successfully pass it before being placed with the healthy cows.

12. When two successive tests fail to detect any reactors in a herd it shall be deemed healthy, and the veterinary inspector shall, when requested, give a certificate to that effect.

13. The existing regulations respecting tuberculosis, in so far as they may be inconsistent with the present regulations, are hereby repealed.

Vide Canada Gazette, vol. xlvii, p. 4447. |

By an Order in Council of date the 6th day of June, 1914, the following regulations under "The Dairy Industry Act, 1914," were made and established:—

DEFINITIONS.

1. In these regulations, unless the context otherwise requires:—

- (a) "Act" means "The Dairy Industry Act, 1914;"
- (b) "Minister" means the Minister of Agriculture;
- (c) "brand" means any mark, stencil, stamp, label, or writing placed on cheese, or on any package containing cheese, butter, or other dairy product, for the purpose of designating a particular grade or classification, the place of manufacture or the country of origin;
- (d) "butter" means the food product commonly known as butter, which is manufactured exclusively from milk or cream or both, with or without the addition of colouring matter, common salt, or other harmless preservatives;
- (e) "creamery" means a place where the milk or cream of not less than fifty cows is manufactured into butter;
- (f) "creamery butter" means butter which is manufactured in a creamery;
- (g) "dairy" means a place where the milk or cream of less than fifty cows is manufactured into butter;
- (h) "dairy butter" means butter which is manufactured in a dairy;
- (i) "dairy product" or "dairy products" means any milk, cream, condensed milk, milk powder, butter, or cheese, or any other article manufactured from milk, and all imitations thereof;
- (j) "package" means any box, tub, crock, tin, crate, case, paper wrapper, or any other receptacle or covering used for the packing of butter;
- (k) "whey butter" means butter which is manufactured from whey.

COMPULSORY BRANDING.

2. All brands placed on cheese or on packages containing cheese or butter, as required by these regulations, shall be legible and indelible, and shall consist of letters not less than one-half an inch long and three-eighths of an inch wide, except in the case of parchment paper wrappers for butter, the branding of which shall be in letters not less than one-quarter of an inch square.

3. Every manufacturer of whey butter shall cause the package containing such whey butter to be branded with the words "whey butter" at the time of packing.

4. Every person who mixes whey butter with creamery butter or with dairy butter, shall cause the packages containing such mixed butter to be branded at the time of packing with the words "whey butter."

5. Every person who mixes dairy butter with creamery butter shall cause the packages containing such mixed butter to be branded, at the time of packing, with the words "dairy butter."

6. Every person who manufactures butter from a mixture of ordinary cream as separated from milk, and cream which has been separated from whey, shall cause the package containing such butter to be branded, at the time of packing, with the words "whey butter."

7. Every person who packs dairy butter in boxes similar to those used for the packing of creamery butter, shall cause such packages to be branded, at the time of packing, with the words "dairy butter."

8. No person shall cut or pack dairy butter into blocks, squares, or prints and wrap such blocks, squares or prints in parchment paper unless the said parchment paper is printed or branded with the words "dairy butter."

9. Every cheesemaker who manufactures cheese from or by the use of milk, commonly known as skim-milk, or milk from which any cream has been removed,

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or milk to which skim-milk has been added, shall brand on the side of every cheese, within twenty-four hours after the cheese is removed from the press, or before it leaves the factory, the words "skim-milk cheese," and also upon the outside of every box or package which contains cheese, the words "skim-milk cheese" at the time the cheese is boxed or packed.

10. When butter is packed in tubs or boxes, all brands required by these regulations shall be applied on the side of the package.

PROHIBITED BRANDING.

11. No person shall brand any package containing butter with the words "creamery butter" or with any combination of the word creamery unless such butter is creamery butter within the meaning of the Act and these regulations.

12. No person shall apply any brand of the word "Canadian," "Canadien" or "Canada" as a descriptive term, mark or brand, upon any cheese or upon any box or package which contains cheese or butter, unless such cheese or butter has been produced in Canada.

13. No person shall brand any cheese, or brand any package containing cheese or butter in any manner that shall give false information as to the country of origin, or as to the cheese factory or creamery in which it was manufactured.

THE SALE OF DAIRY PRODUCTS.

14. No person shall knowingly sell, offer, expose, or have in his possession for sale:—

(a) Any whey butter unless the package containing such whey butter is branded with the words "whey butter;"

(b) Any butter which consists of a mixture of whey butter and creamery butter or whey butter and dairy butter unless such mixture of butter is branded "whey butter;"

(c) Any mixture of dairy butter and creamery butter unless such mixture is branded "dairy butter;"

(d) Any butter manufactured from a mixture of ordinary cream as separated from milk, and cream which has been separated from whey unless such butter is branded with the words "whey butter;"

(e) Any dairy butter packed in boxes similar to those used for the packing of creamery butter unless such packages are branded "dairy butter;"

(f) Any dairy butter packed, moulded, or cut into blocks, squares or prints, and wrapped in parchment paper unless such parchment paper is branded "dairy butter;"

(g) Any cheese manufactured from or by the use of milk commonly known as skimmed milk, or milk from which cream has been removed, or milk to which skimmed milk has been added, unless the words "skim-milk cheese" are branded upon the side of every cheese and also upon the outside of every box or package which contains cheese;

(h) Any butter branded as creamery butter or any combination of words which includes the word creamery unless such butter is creamery butter according to the definition in the Act, and in these regulations;

(i) Any cheese upon which the word "Canadian," "Canadien," or "Canada" is branded, or any cheese or butter contained in any package upon which the word "Canadian," "Canadien," or "Canada" is branded as a descriptive term, unless such cheese or butter has been produced in Canada;

(j) Any cheese which is branded or any cheese or butter which is con-

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tained in a package which is branded in such a manner as to give false information as to country of origin, or as to the cheese factory or creamery in which it was manufactured.

15. No person, except the final purchaser or consumer, shall remove, obliterate or erase or cause to be removed, obliterated, or erased, any brand placed upon any cheese, or upon any package containing cheese or butter as required by these regulations.

16. Any person who violates any regulation made under the authority of the Act shall for each offence, on summary conviction, be liable to a fine of not less than ten dollars nor more than thirty dollars.

17. Any pecuniary penalty imposed under these regulations shall, when recovered, be payable, one-half to the informant or complainant and one-half to His Majesty.

18. These regulations shall come into force on the first day of September, 1914.

Vide Canada Gazette, vol. xlvii, p. 4354.

By an Order in Council of date the 20th day of June, 1914, the regulations under "The Cold Storage Act," established by Order in Council of the 11th March, 1910, were amended by adding thereto the following sections:—

"9. Owners or managers of cold storage warehouses with whom contracts have been entered into for the payment of subsidies under the Cold Storage Act;

"(a) Shall give the public the preference in the use of the refrigerated space in such warehouses. It shall be deemed to be a violation of the regulations if the owner of the warehouse refuses to receive goods from the public at the approved rate for storage on the ground of lack of space, when any part of the space is occupied by goods which are the property of the owners of the warehouse;

"(b) Shall not contract or agree to give all the refrigerated space to one or more firms to the exclusion of the general public;

"10. Owners or managers of cold storage warehouses with whom contracts have been entered into for the payment of subsidies under the Cold Storage Act and who receive fish for storage shall accept herring at the usual rate and if delivered in the usual manner, irrespective as to whether said herring are to be used for food or for bait;

"11. Every person who violates any of the above said regulations shall for every such offence incur a penalty not exceeding fifty dollars."

Vide Canada Gazette, vol. xlvii, p. 5.

By an Order in Council of date the 2nd day of October, 1914, under and in virtue of the authority conferred by the "War Measures Act, 1914," the Governor General in Council was pleased to order that the following orders and regulations respecting patents of invention be made and established:—

1. "Commissioner" means the Commissioner of Patents and includes the Deputy Commissioner of Patents.

2. The commissioner may, on the application of any person, and subject to such terms and conditions, if any, as he may think fit, order the avoidance or suspension, in whole or in part, of any patent or license, the person entitled to the benefit of which is the subject of any State at war with His Majesty, and the Commissioner, before granting any such application, may require to be satisfied on the following heads:—

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(a) That the person entitled to the benefit of such patent or license is the subject of a State at war with His Majesty;

(b) That the person applying intends to manufacture or cause to be manufactured, the patented article, or to carry on, or cause to be carried on, the patented process within the Dominion of Canada;

(c) That it is in the general interests of the country, or of a section of the community, or of a trade, that such article should be manufactured or such process carried on as aforesaid.

The fee payable on such application shall be ten dollars.

The commissioner may at any time, in his absolute discretion, revoke any avoidance or suspension of any patent or license ordered by him.

Provided always that the commissioner may at any time, if in his absolute discretion he deems it expedient in the public interest, order the avoidance or suspension in whole or in part of any such patent or license upon such terms and conditions, if any, as he may think fit.

3. In any case in which the commissioner makes an order by virtue of the powers vested in him under these rules and regulations or any of them, avoiding or suspending in whole or in part a patent, he may, in his discretion, grant in favour of persons other than the subject of any State at war with His Majesty, license to make, use, exercise or vend the patented invention so avoided or suspended, upon such terms and conditions and either for the whole term of the patent or for such less period as the Commissioner may think fit.

4. The commissioner may, at any time during the continuance of these orders and regulations, avoid or suspend any proceedings on any application made under the Patent Act by a subject of any State at war with His Majesty.

5. The commissioner may also, at any time, during the continuance of these orders and regulations, extend the time prescribed by the Patent Act or any rules made thereunder, for doing any act or filing any document, upon such terms and subject to such conditions as he may think fit in the following cases, namely:—

(a) Where it is shown to his satisfaction that the applicant, patentee, or proprietor, as the case may be, was prevented from doing the said act, or filing the said document, by reason of active service or enforced absence from this country, or any other circumstances arising from the present state of war, which, in the opinion of the commissioner, would justify such extension;

(b) Where the doing of any act would, by reason of the circumstances arising from the present state of war, be prejudicial or injurious to the rights or interests of any applicant, patentee or proprietor as aforesaid.

Such extension of any prescribed time, if granted after its expiration, shall have the same effect as if granted prior thereto, provided such expiration occurred on or after the fourth day of August, 1914.

6. The commissioner may refuse to register the assignment of any patent made by a subject of any State at war with His Majesty and filed in the Patent Office on or after the fourth day of August, 1914, unless satisfied that such assignment was made in good faith and not for the purpose of evading any of the provisions of the foregoing orders and regulations.

7. The term "person" used in these orders and regulations shall, in addition to the meaning given thereto by par. 20 of section 34 of "The Interpretation Act," include any government department.

8. These orders and regulations shall come into operation as and from the fourth day of August, 1914.

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9: The orders and regulations respecting Patents of Invention made under "The War Measures Act, 1914," and dated the 11th September, 1914, are hereby rescinded and repealed.

Vide Extra Canada Gazette, October 5, 1914.

By an Order in Council of date the 24th day of November, 1914, the regulations under the "Destructive Insect and Pest Act" respecting destructive insects, pests, and plant diseases, established by Order in Council of the 4th November, 1914, were amended as follows:—

- No. IV, 1. First line, eighth word "State" to read "States;"
First line, after tenth word, add the words "and New York;"
- N. IV., 1. (a) First line, ninth word "State" to read "States";
First line, after eleventh word, add the words "and New York;"
First line, delete last word "one," and insert instead "two;"
Second line, eleventh word "State" to read "States;"
- No. IV, 1. (b) First line, last word "State" to read "States;"
Second line, after second word add "and New York;"
- No. IV, 1. (c) First line, seventh and eighth words "this State" to read "these States;"
- No. IV, 1. (d) First line, eighth word "State" read "States;"
First line, after tenth word add "and New York."

Vide Canada Gazette, vol. xlviii, p. 1893.

By Order in Council of date the 6th January, 1915, His Royal Highness the Governor General was pleased to exercise the powers granted by the Royal Proclamation published in *The Canada Gazette* of date the 15th October, 1914, for the purpose of granting licenses for the Dominion of Canada similar to that granted by the British Board of Trade under date the 4th November, 1914, and published in *The London Gazette* of the 6th November, 1914, as follows:—

"To pay any fees necessary for obtaining the grant or for obtaining the renewal of patents or for obtaining the registration of designs or trade marks or the renewal of such registration in an "enemy country;" and

"Also to pay on behalf of an "enemy" any fees payable in the United Kingdom on application for or renewal of the grant of a patent or on application for the registration of designs or trade marks or the renewal of such registration."

By an Order in Council of date the 11th of January, 1915, the regulations under "The Destructive Insects and Pest Act," established by Order in Council of the 4th November, 1914, were amended by inserting after the word "removed" in the third line of the Plant Disease Regulations IV, section 2, definition "table potatoes," the following words:—

"And which are of good quality, sound, and otherwise fit for human consumption."

Vide Canada Gazette, vol. xlviii, p. 2201.

By an Order in Council of date the 8th day of February, 1915, in pursuance of the provisions of an Order in Council of date the 6th day of January, 1915, respecting the granting of licenses in connection with the Royal Proclamations relating to Trading with the Enemy, published in *The Canada Gazette* on the 12th day of Sep-

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tember, 1914, and the 15th day of October, 1914, His Royal Highness the Governor General in Council gave and granted licenses to all persons resident carrying on business or being in the Dominion of Canada:—

To pay any fees necessary for obtaining the grant or for obtaining the renewal of patents or for obtaining the registration of designs or trade marks or the renewal of such registration in an “enemy country;”

An also to pay on behalf of an “enemy” any fees payable in the Dominion of Canada on application for or renewal of the grant of a patent or on application for the registration of designs or trade marks or the renewal of such registration.

The expression “enemy country” herein means the territories of the German Empire and of the Dual Monarchy of Austria-Hungary, together with all the Colonies and Dependencies thereof, as well as the Dominions of His Imperial Majesty the Sultan of Turkey other than any territory in the occupation of His Britannic Majesty or His Allies.

The expression “enemy” herein means any person or body of persons of whatever nationality resident or carrying on business in the enemy country, but does not include persons of enemy nationality who are neither resident nor carrying on business in the enemy country. In the case of incorporated bodies, enemy character attaches only to those incorporated in an enemy country.

By an Order in Council of date the 27th day of March, 1915, the regulations under “The Animal Contagious Diseases Act,” established by Order in Council of the 30th November, 1909, and amendments thereto, were further amended by rescinding section 88½ and substituting the following section in lieu thereof:—

“88½. The importation, manufacture, sale or use of hog cholera serum or virus, except by an inspector acting under the special authority of the Veterinary Director General, is prohibited.”

Vide Canada Gazette, vol. xlviii, p. 3096.

A report from the Canadian Exhibition Commissioner for the fiscal year ended March 31, 1915, will be found as an appendix hereto. (See appendix No. 18.)

The Canadian Exhibition Commissioner and staff have been busily engaged in the preparation of a Canadian display of the natural resources of the Dominion for exhibit at the Panama-Pacific International Exposition now being held at San Francisco, and I am pleased to say that the Canadian exhibit was the only one completed for the opening day, February 20, 1915.

I had the pleasure of going to assist in the dedication of the Canadian building, and had the advantage of seeing what they were doing.

I may say, without hesitation, that not only has Canada the best exhibit it ever had at any exhibition, but it is quite evident we have made the centre of attraction of the whole exhibition among the nations. We have the best exhibit and the best building, I think, of the whole exhibition.

Canada participated in the Sixth International Dairy Congress, held in Berne, Switzerland, in June, 1914, and was represented thereat by Mr. J. A. Ruddick, the Dairy and Cold Storage Commissioner.

Canada participated in the Tenth International Veterinary Congress, held in London, England, in August, 1914, and was represented thereat by Dr. F. Torrance, the Veterinary Director General.

II. ARTS AND AGRICULTURE.

DAIRY AND COLD STORAGE BRANCH.

The appointment of a fruit commissioner on May 1, 1914, relieved the Dairy and Cold Storage Commissioner of the responsibility for the work of the Fruit Division, and confined the operations of the branch under his charge to dairying, extension of markets, and cold storage.

The following is a summary of the main activities of the Dairy and Cold Storage Branch during the year under review:—

I. DAIRYING.

COW TESTING.

Farmers have been encouraged and assisted to keep records of the quantity of milk produced by each cow for the purpose of distinguishing the profitable ones from those that are unprofitable. Record forms are sent, free of charge, to all who apply for them.

DAIRY RECORD CENTRES.

Additional Dairy Record Centres have been organized, with an expert in charge of each, who gives his whole time to a limited district and endeavours to get all the farmers in his territory to weigh each cow's milk and to take samples for testing at regular intervals.

Once a year a complete census of all the herds in the district is taken, with full particulars as to breeding, feeding, and means to improve the average production.

There were thirty-five of these Dairy Record Centres in operation in 1914.

The propaganda in connection with the cow testing movement consists of:—

- (a) The publication of popular bulletins and circulars on the subject;
- (b) The frequent preparation of short articles for the press dealing with various aspects of the work and citing specific cases of increase in milk yield as a result of systematic testing;
- (c) Addresses given by the recorders, provincial supervisors, and members of the headquarters staff;
- (d) Personal visits to farmers by recorders; and
- (e) A very extensive correspondence.

The average production of milk in Canada has been increased by 1,000 pounds per cow since this work was started. With over two and a half million cows in Canada the value of the total annual production is thus increased by at least \$25,000,000, and the work is only just begun.

A MODEL CHEESE FACTORY.

A model cheese factory and creamery is operated at Finch, Ont., on a regular commercial basis. This establishment is conducted for the purpose of:—

- (a) Demonstrating the advantages of certain improvements in the construction of cheese factory and creamery buildings;

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- (b) To determine the value of new apparatus and machinery and also new methods and practices in the manufacture of cheese and butter;
- (c) To encourage the production of winter milk; and
- (d) To encourage proper business methods in the management of factories.

A MODEL CREAMERY.

A model creamery is operated at Brome, Que., for the same purposes and with the same objects in view as in the case of the factory at Finch.

EXPERIMENTAL AND DEMONSTRATION WORK.

Investigations and experiments relating to dairy manufacturers, and the handling of milk, are conducted from time to time as occasion arises.

New processes are demonstrated and illustrated in order to bring them to the attention of those interested.

Lantern slides are used as far as possible in lecture and demonstration work.

II. CREAMERY AND FARM COLD STORAGES.

A bonus of \$100 is paid to any creamery that erects suitable cold storage rooms according to plans and specifications furnished free by the department.

Working plans and specifications for small cold storages and dairies suitable for the use of farmers, hotels, and country merchants are also distributed free to all who apply for them.

III. REFRIGERATOR CAR SERVICES.

FOR BUTTER.

An arrangement is in force with the railway companies in Ontario, Quebec, and Nova Scotia, for a refrigerator car service for butter, covering the period from the middle of May to the middle of October. These cars are run weekly or fortnightly, according to the requirements of the route, on an advertised schedule, so that shippers can deliver their butter to the station with the least possible exposure to heat. A shipper may forward any quantity from one package upwards, and pay only the regular less-than-carload rate, without extra charge for icing. The department guarantees, on each car, two-thirds of the earnings of a minimum carload from starting point to destination, plus about two-thirds of the cost of icing. Inspectors are engaged at freight terminals to watch the unloading of these cars, to report on their condition and on the temperature of the butter and the quantity of ice remaining in the bunkers. The reports are sent daily to headquarters at Ottawa, and any defects or deficiencies in the service are brought to the attention of the responsible railway authorities. In this way an efficient service is maintained.

FOR CHEESE.

Commencing about the middle of June and extending for a period of eleven weeks, the department pays the icing charges, up to \$5 per car, on a limited number of refrigerator cars, when used for carload shipments of cheese from one station.

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FOR FRUIT.

A similar arrangement, except that there is no limit to the number of cars, is in force from the first of August to the first of October, for shipments of early apples and tender fruits, in carloads, consigned to Montreal and Quebec for export in cold storage.

IV. RESERVED CHAMBERS FOR FRUIT.

Exporters of early apples and other tender fruits who wished to ship in cold storage from Montreal to the United Kingdom frequently found it difficult to do so, because the quantity they had to offer was so small that it was not worth while for a shipping company to operate a whole chamber to handle it exclusively, it not being permissible to carry other produce with fruit. To overcome this difficulty, the department through this Branch has, for a number of years past, arranged with the steamship lines to different ports to have one chamber reserved for fruit on certain steamers sailing during the months of August, September, and part of October, the department guaranteeing a revenue equal to the earnings of one-half of the chamber. Of late years the chamber has nearly always been well filled.

V. CARGO INSPECTION.

Cargo inspectors are stationed at Montreal, Quebec, Halifax, Liverpool, Bristol, London, and Glasgow to report on the condition in which perishable goods are delivered to and discharged from the steamships, and to supervise the handling generally. A large number of self-recording thermometers, or thermographs, are used in this service, and the records of temperature thus obtained are available for interested shippers of fruit, cheese, meats, etc. A Canadian shipper may, by application to the Dairy and Cold Storage Commissioner, secure complete records of any consignment from the time the goods arrive at the loading port in Canada until they are distributed in the United Kingdom. This applies also, but not so generally, to shipments for South Africa and Australasia.

VI. A PRE-COOLING AND FRUIT STORAGE WAREHOUSE.

The experimental cold storage warehouse which has been erected at Grimsby, Ont., under the direction of the Dairy and Cold Storage Commissioner, is now in full working order.

The fruit growers in this district are pretty generally convinced that in order to get the best results in catering to the Northwest or Old Country markets, or even for long distance shipment in Eastern Canada, it is absolutely necessary that tender fruit should be thoroughly cooled before shipment, and it only remains to demonstrate a satisfactory method that may be generally adopted with that end in view. Several schemes were proposed and discussed, including one for a large central car-cooling plant to serve the whole district, but after due consideration the plan of having a relatively small cold storage warehouse at each important shipping point seemed to give the greatest promise of successfully meeting the needs of the situation.

The growers of any particular locality naturally hesitate before making an investment which is more or less of an experiment, and as the results when worked out at

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Grimsby will be of value to the whole district and to other districts as well, the undertaking seems to be a fitting object of governmental initiative.

The control and operation of this cold storage warehouse by the department is serving (a) to demonstrate the advantages of the pre-cooling of fruit, and (b) to determine the practicability of pre-cooling in a warehouse rather than the cars after loading.

Being fully equipped with every device for the purpose, it will afford excellent facilities for experimental investigations and the scientific study of the problems connected with the storage and transportation of fruit, as well as those which relate to general cold storage work.

Incidentally the shippers of the Grimsby district will be able to use the warehouse for commercial pre-cooling and storage, on payment of the usual rates for such services.

VII. THE ENFORCEMENT OF LAWS.

The Dairy and Cold Storage Commissioner is charged with the routine administration of the Cold Storage Act, 1907; the Dairy Industry Act, 1914; and the Cold Storage Warehouse Act, 1914.

DAIRY LAWS.

The leading features of the Dairy Industry Act of 1914 are the sections which prohibit the importation, manufacture or sale of:—

- (a) butter substitutes of any kind;
- (b) renovated or process butter;
- (c) butter containing over 16 per cent of water, and
- (d) cheese adulterated with fats other than the fat of milk.

The regulations under the Dairy Industry Act provide for the marking of dairy products in such a manner as to protect the honest trader and the consumer from misrepresentation and fraud.

COLD STORAGE LAWS.

The Cold Storage Act (chapter 6, 6-7 Edward VII), of which the details of administration are also in the hands of the Dairy and Cold Storage Commissioner, is intended chiefly to encourage the erection of small local public storage warehouses for the preservation of perishable food products. It provides that the Government may grant a sum not exceeding 30 per cent of the total cost of site, equipment, and construction of such public cold storage warehouses. The subsidy is paid in instalments which are spread over a period of four years. No assistance is given to any company proposing to build in places where a public cold storage is already in existence. The rates charged in subsidized warehouses are subject to the approval of the Governor in Council.

The Cold Storage Warehouse Act of 1914, gives the Governor in Council power to make regulations respecting the operation and control of cold storage warehouses, and the articles of food stored therein.

VIII. PUBLICATIONS AND INSTRUCTIONS.

An annual report is published showing in detail the work of the branch. Bulletins and circulars on various subjects are issued from time to time for free distribution.

Members of the staff address a large number of farmers' meetings throughout the year, officiate as judges at dairy exhibitions and at milking competitions and, through an extensive correspondence, act in an advisory capacity on a great variety of subjects.

IX. WAR OFFICE SUPPLIES.

On October 1, 1914, when the department assumed control of the purchase and shipment of hay and oats for the War Office to be used by the army in France, Mr. J. A. Ruddick, Dairy and Cold Storage Commissioner, was instructed to take charge. The shipments to date total 64,026 gross tons of oats, and 51,811 gross tons of hay. The hay is all re-compressed into comparatively small compact bales, and the oats are all put up in 80-pound sacks. The supervision of this work has naturally demanded a large share of the commissioner's time, as well as that of his assistants, Messrs. W. W. Moore and J. N. Lemieux.

SEED COMMISSIONER'S BRANCH.

The work of this branch may be classified into three general divisions: seed growing, seed testing, and seed inspection. Under seed growing is included educational, investigation, and other work directed toward encouraging the production and use of better seed. Seed testing involves the analysis of samples which are sent to the laboratories at Ottawa and Calgary by seed merchants and farmers, as well as many other tests in connection with departmental investigations. The regular work of seed inspection for the enforcement of the Seed Control Act consists in visiting seed merchants and farmers who have seed for sale to give information in respect to the Act and to see that its provisions are being observed.

SEED GROWING.

The general policy respecting the various phases of seed growing work outlined in previous reports has been continued during the past year, and some new lines of investigation and educational work has been taken up.

Financial assistance toward conducting field-crop competitions, seed fairs, and provincial seed exhibitions has been continued, and with very gratifying results. The Provincial Departments of Agriculture report continued increase in the usefulness of these organizations. The number being conducted by the local agricultural societies has grown rapidly, and much has been done to stimulate more interest in better seed as a means toward increased production. On the present basis, nearly \$50,000 is available to the provinces for subvention. The statements have not all been received for last year, but from those to hand it is evident that there has been a substantial increase in the money paid out for prizes compared with the year previous, and a much larger proportion of the subvention available will be claimed.

The subventions offered for growing field root and garden vegetable seeds in Canada are being continued. Last fall special efforts were made to induce more

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farmers to select roots with the object of producing their own seed supply as a safeguard against a possible shortage because of the war in countries where most of our supplies are ordinarily obtained.

Several lines of investigational work have been carried on, details of which may be found in the report of the Seed Commissioner for the year ending August 31, 1914, and special bulletins.

Timothy seed production in Western Canada has been given special attention, and it is believed that information has been secured which will be of assistance in placing this branch of farming on a better basis.

An inquiry in regard to the quality of the wheat, oats, barley, flax, and ensilage corn being used for seed in Canada has been completed, and the results reveal a condition not highly creditable to Canadian agriculture. It is apparent that the importance of good seed in relation to grain production is not generally appreciated. On the contrary, the value of Canada's grain crops is enormously reduced each year through lack of attention to proper selection and preparation of seed. Much educational work is needed to impress the importance of more attention to seed selection and to give information in regard to the equipment required for fanning mills and methods of handling them.

From information gathered in connection with the special inquiry referred to, and the field work and seed laboratory tests, it is evident that there is great need for a more abundant supply of seed corn of strong vitality and of a variety and strain suitable for the conditions under which it is to be grown. Numerous partial or total crop failures with ensilage corn have come through using seed that will not grow, and in many instances poor crops in both yield and quality have resulted from using late varieties and strains which do not mature sufficiently to make good ensilage. With the object of improving the seed supply in southwestern Ontario, assistance has been given toward securing information in regard to methods of storing and drying seed corn, and financial assistance has been offered to farmers' clubs for erecting corn-drying houses. Special inspection work has been done to determine the germination qualities of the seed corn available in southwestern Ontario, and, in co-operation with officers of the Provincial Department of Agriculture, assistance has been given in conducting variety tests to ascertain which varieties are most suitable for various districts.

The accumulation and disposition of screenings at the terminal elevators, including the various uses to which they are put, their feeding value and the danger of weed dissemination in feeding them to stock, have been given special attention during the past season. Fairly complete information has been secured, except in respect to the feeding value of different kinds of screenings. Extensive experiments with different kinds of stocks are being conducted in co-operation with the Experimental Farms Branch and the Animal Industry Department of Macdonald College, Quebec, in order to get information on this point.

In the spring of 1914 an investigation was commenced to determine the prevalence of weed seeds in farm lands, and to discover, if possible, the relation of their prevalence to different cultural practices. The work last year was largely of a preliminary nature, although some very suggestive results were secured. There is already suffi-

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cient evidence to indicate that weed seeds are present in enormous numbers in ordinary farm lands, and that many of them will retain their vitality for a long time under ordinary systems of cultivation. The investigation will be continued for several years, and it is hoped that information will be obtained which will be suggestive of better weed control.

Considerable general educational work has been done in co-operation with the Provincial Departments of Agriculture and local agricultural organizations. Assistance has been given in conducting seed judging classes at short courses, and educational exhibits have been prepared for some of the leading exhibitions. In order to stimulate the demand for cleaning equipment, and to furnish means whereby information might be obtained in regard to the sieves required for cleaning and grading different kinds of seed, sets of thirty-four hand sieves have been distributed free to the Ontario Department of Agriculture district representatives and the Macdonald College demonstrators in Quebec. These screens are used for short-course work and are at the disposal of farmers to find out which sieves are needed for their purpose.

The policy of distributing weed and economic seeds has been continued, and a special free distribution to schools has been made. The collections contain 100 species of seeds, twenty-five economic plants and seventy-five of weeds. They are sold at \$2 per set to seed merchants and agricultural organizations. Last year, 500 lots were prepared and distributed to schools where agriculture forms a part of the instruction. The distribution was made to schools recommended by the Provincial Departments of Education.

Financial assistance to the Canadian Seed Growers' Association has been continued, and the annual report of the association has been printed by this branch for general distribution. Owing to the increase in the regular seed inspection work required by officers of this branch, it has been necessary to discontinue the inspection of seed grown by members of the association. This work is now being done by officers appointed by the association.

SEED TESTING.

The number of samples tested for seed merchants and farmers at the Ottawa laboratory has been slightly in excess of previous seasons. During the laboratory year ending August 31, 1914, 11,373 samples were received, compared with 11,301 during the previous year. From September 1, 1914, to March 31, 1915, 9,022 samples were received, compared with 8,376 in the same period the previous year. At Calgary, the volume of work required was smaller than for several seasons. During the year ending August 31, 1914, 3,733 samples were received, which is less than one-half the average of the two previous years. Most of the work at Calgary is testing vitality of cereals for farmers, and the decrease in the number received was due to the good conditions under which the grain was harvested in 1913. From September 1, 1914, to March 31, 1915, there was a large increase in the number of samples tested at Calgary compared with the previous season. The number of purity tests of timothy, red clover, alsike, and alfalfa made at Calgary during the past season increased over 50 per cent. The increase in the proportion of samples tested for purity has been a

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feature of the Calgary work for several years which is an indication of the greater attention to quality of clover and grass seed being used by both seed merchants and farmers. Many of the samples received at both laboratories are tested for both purity and germination.

About 25 per cent of the trade samples tested at the Ottawa laboratory during the year were received in March. For the two months from the middle of February to the middle of April the number received daily averages over 100, which means that more than one-half of the samples tested during the year were received within two months. The nature of the information required in relation to these samples makes it essential that they be examined and reported upon with the least possible delay. It is the aim of the laboratory to issue reports on all samples the day on which they are received, and reports are seldom delayed more than thirty hours after receipt of the samples. To ensure prompt and accurate reports it is necessary to maintain a fairly large staff of highly trained analysts. Last year for the first time since the laboratory was opened a charge was made for seed testing. Twenty-five cents per test is now charged on all samples in excess of twenty-five received from any one farmer or merchant during one year. The main purpose of this charge is to regulate and restrict the service required to work productive of information of real value to the sender.

SEED INSPECTION.

The inspection of seed offered for sale in connection with the administration of the Seed Control Act has been extended and made more thorough. In the spring of 1914, thirty permanent and temporary inspectors were employed. They visited 1,861 towns, an increase of 30 per cent over the number visited the season previous. Many of these places were inspected several times. The total number of dealers or farmers visited was 5,173, compared with 4,212 the year before. On the whole, there has been a marked improvement in the quality of the seed being offered for sale, especially that handled through wholesale dealers, and fewer violations have been detected and fewer prosecutions necessary. In the spring of 1914 there were 708 violations of the Act detected, a decrease of 131 from the previous year, although there was an increase of 961 in the number of dealers visited. Most of these violations were not of a serious nature, consisting mostly in failure to have grade numbers properly marked. Only thirty-one dealers were prosecuted compared with seventy-five the previous season.

A large proportion of the violations were through seed obtained direct from growers and not properly cleaned and tested before being offered for sale. With a few exceptions the seed supplied by the wholesale dealers has been put on the market in conformity with the Seed Control Act. Several minor violations were detected through failure of the retail dealers to preserve the tags bearing the grade numbers.

The inspection work so far conducted this spring indicates a still further improvement in the trade, and fewer violations are being observed in proportion to the number of dealers visited.

In the fall of 1914 a request was received from the Honourable the Minister of the Interior for co-operation in connection with the purchasing and distribution of seed grain to needy settlers in Saskatchewan and Alberta, and under my instructions

the Seed Branch officers are co-operating with the purchasing commissioners of the Interior Department. Seed which is passed by officers of this branch is accompanied by a certificate of inspection in each bag. This special inspection work has involved a great deal of extra work and has interfered more or less with the regular inspection of the seed trade in the Prairie Provinces.

THE LIVE STOCK BRANCH.

In reviewing the work of the year, it will be of interest to note that, to provide for the increasing work of the branch, there have been added to the staff during that period twelve permanent employees in the Inside and Outside Service, together with a considerable number of temporary officers employed in field work. The present permanent staff, consisting of fifty-five persons, is two and three-quarters times as large as it was four years ago, when twenty persons only were employed.

In a comparison of the expenditures of the year just closed, and of preceding years, a corresponding increase is to be reported. The expenditure for 1911-12 amounted to \$94,011.14; that for 1912-13, to \$100,821.94, that for 1913-14 to \$174,637.96, while that for 1914-15, although the final figures are not yet available, will amount to more than \$300,000.

That the activities of the branch have increased very greatly during the past three or four years may be gathered from the data just furnished with respect to the additions to the staff and to the expanding expenditures in the interest of live stock development. As in 1913, perhaps the most significant feature of the year's work has been the administration of the policy respecting the loan of pure-bred male animals. The advantages of this policy have now been brought to the attention of a very large number of farmers throughout all the provinces of the Dominion, and the tables which follow will serve to indicate the extent to which associations of farmers have availed themselves of the benefits to be derived from the use of the pure-bred sires distributed under this scheme.

STALLIONS LOANED TO ASSOCIATIONS OF FARMERS DURING 1914.

Breed.	B.C.	Alta.	Sask.	Man.	Ont.	Que.	N.B.	N.S.	P.E.I.	Total.
Clydesdale		17	13	7	3	13	2	4	2	61
Percheron.....		8	4		1					13
Belgian						1				1
Suffolk Punch.....		1								1
Thoroughbred.....						1				1
Hackney.....						3	1			4
Standard bred.....								1		1
French Canadian.....						15				15
Totals		26	17	7	4	33	3	5	2	97

During 1913, five stallions only were distributed. Of these, Ontario received three, all being Clydesdales; Quebec two, of which one was a Percheron and one a Clydesdale.

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BULLS LOANED TO ASSOCIATIONS OF FARMERS DURING 1913-14.

Breed.	Maritime.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Total.
	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14	13'—'14
Shorthorn.....	.. 14	.. 42	9 24	19 21	29 102	19 55	.. 4	76 262
Ayrshire.. .....	.. 15	.. 49	.. 1	.. ..	1 4	.. 1	2 1	3 71
Holstein.. .....	.. 4	.. 10	3 4	4 5	3 10	4 2	1 1	15 36
Hereford.....	.. ..	.. 1	.. 3	3 2	.. 5	1 8	.. ..	4 19
Angus .....	.. ..	.. ..	.. ..	1 1	1 4	.. 3	.. ..	2 8
Jersey.....	.. 4	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. 5
Canadian.. .....	.. ..	.. 7	.. ..	.. ..	.. ..	.. ..	.. ..	.. 7
Red Polled.....	.. ..	.. ..	.. ..	.. 1	1 2	.. ..	.. ..	1 3
Devon.....	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. 1
Galloway.. .....	.. ..	.. ..	.. ..	.. ..	.. ..	.. 1	.. ..	.. 1
Guernsey...	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. 1
Total. ....	.. 39	.. 110	12 32	27 30	35 127	24 70	3 6	101 414

RAMS LOANED TO ASSOCIATIONS OF FARMERS DURING 1913-14.

Breed.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	Total.
	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14
Shropshire.	28 30	19 24	6 16	18 133	2 7	2 ..	1 3	6 10	82 223
Oxford Down.....	.. 17	38 58	9 1	5 18	3 4	11 5	.. 1	.. 1	66 105
Leicester.....	.. 5	.. ..	.. 1	8 40	16 15	.. 1	2 ..	.. ..	26 62
Cheviot.....	4 1	4 ..	.. ..	.. 13	.. ..	.. 1	.. ..	.. ..	8 15
South Down.....	4 2	.. 3	.. ..	3 1	.. 1	.. ..	.. 1	.. ..	7 8
Hampshire.....	.. ..	.. ..	4 ..	3 ..	.. ..	.. ..	.. ..	.. ..	7 ..
Lincoln... .....	.. ..	.. ..	.. ..	3 1	.. ..	.. ..	.. ..	.. 1	2 2
Suffolk.....	.. ..	.. ..	.. ..	.. ..	.. ..	3 ..	.. ..	.. ..	3 ..
Cotswold .....	.. ..	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. 1
Total	36 55	61 86	19 18	40 206	21 27	16 7	3 5	6 12	202 416

BOARS LOANED TO ASSOCIATIONS OF FARMERS DURING 1913-14.

Breed.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Total.
	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14	'13—'14
Yorkshire. ....	.. 3	3 5	3 3	23 63	8 5	3 2	13 10	2 6	.. ..	55 97
Berkshire.....	5 ..	1 1	.. 1	.. 1	5 4	8 5	15 23	21 13	3 1	58 49
Poland China.. ..	.. ..	.. ..	.. ..	.. 2	1 ..	4 1	1 12	.. 7	.. ..	6 22
Duroc Jersey...	.. ..	.. ..	.. ..	.. ..	.. ..	1 ..	1 4	8 2	1 ..	11 6
Chester White.. ..	.. ..	3 3	.. 1	1 4	3 ..	.. ..	.. ..	.. ..	.. ..	7 8
Tamworth.....	.. ..	.. ..	.. ..	.. 1	.. ..	.. 1	.. 1	1 ..	.. ..	1 3
Total..	5 3	7 9	3 5	24 71	17 9	16 9	30 50	32 28	4 1	133 185

APPLICATIONS FOR STALLIONS, 1915.

Prince Edward Island.. . . .	2
Nova Scotia.. . . .	2
New Brunswick.. . . .	1
Quebec... . .	39
Ontario... . .	....
Manitoba.. . . .	5
Saskatchewan.. . . .	71
Alberta.. . . .	58
British Columbia... . .	2
Total.. . . .	180

APPLICATIONS FOR BULLS, 1915.

Breed.	B.C.	Alta.	Sask.	Man.	Ont.	Que.	Maritime.	Total.
Shorthorn.....	6	67	126	13	21	40	16	289
Ayrshires.. . . .	3	1	1	....	2	59	25	91
Holstein.....	6	2	9	2	4	13	5	41
Hereford.....	....	4	5	4	....	3	1	17
Angus.....	....	3	4	4	1	....	....	12
Jersey.....	1	....	....	....	....	1	....	2
Canadian... . .	....	....	....	....	....	2	1	3
Red Polled.....	....	2	2	1	....	....	....	5
Guernsey.....	....	....	....	....	....	....	1	1
Galloway. . . . .	....	1	....	....	....	....	....	1
Total.....	16	79	148	24	28	118	49	462

Regarding the distribution of stallions, reference should be made to the fact that the applications for the loan of horses, during the current year, have been received particularly from the more recently settled districts of Saskatchewan and Alberta. Some of the associations applying have been formed in districts situated considerably more than one hundred miles north of any railway line. The primary object of the policy is thus being definitely effected, in that pure-bred sires of good type and quality are being rendered available to sections of the country where otherwise scrub stock of indiscriminate breeding could alone be secured.

The stallions purchased have thus far proven reasonably satisfactory, and with very few instances, the associations have commented favourably upon the excellence of the individuals with which they have been supplied. Eighty per cent of the associations to which horses were loaned in 1913 have forwarded to the department renewal applications for the current year.

The task of securing such a large number of bulls as were required in 1914 was admittedly a difficult one, by reason of the active demand for breeding stock of certain breeds which existed in the spring of 1914. In fact, owing to the scarcity of bulls, it was necessary to hold over until 1915 many applications which were received late in the season.

It is but natural to expect that, as a result of the introduction of bulls of superior breeding into sections hitherto obliged to use scrub sires of nondescript type, a marked improvement in the herds of the country will be found. Reports received from associations which were supplied with bulls in 1913 indicate that the benefits are

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becoming apparent, and that the efforts of the department are appreciated. Further evidence of the popularity of the policy is afforded by the fact that the number of applications from new associations, received for the season of 1915, considerably exceeds the number dealt with in 1914. It is also gratifying to know that in the western provinces, and particularly in Saskatchewan, the desire to increase the number and size of the herds and to improve the quality has evidently not suffered a relapse as a result of the impetus given to grain production by the outbreak of the war.

For the information of those who are not yet fully acquainted with the policy, a statement of the general rules governing distribution follows:—

GENERAL RULES GOVERNING DISTRIBUTION.

1. All animals placed remain the property of the Department of Agriculture and are subject to the general control and supervision of the Live Stock Commissioner.

2. The Live Stock Commissioner reserves the right to inspect an animal at any time and to withdraw it from the hands of an association in the event of it being found in unsatisfactory condition or should he consider that the management of the affairs of an association is not in accord with the intention of the department.

3. The wishes of an association, as expressed at a regularly called meeting shall, subject to the approval of the Live Stock Commissioner, determine the breed from which the sire placed shall be selected. It shall be understood, however, that in the case of all classes of stock, any sire which may subsequently replace the one originally placed shall be of the breed primarily chosen by the association.

4. Breeding privileges shall be restricted to members of the association.

5. The Live Stock Commissioner reserves the right to determine the maximum number of females to be bred to any individual sire placed with an association. In no case shall the maximum allowed exceed the following:

Stallions—3 years old, 50 mares; 4 years old, 75 mares; 5 years old and over, 100 mares.

Bulls—Yearling, 35 cows; 2 years old, 60 cows; 3 years old and over, 90 cows.

Rams—Lambs, 40 ewes; yearling or over, 50 ewes.

Boars—50 sows.

The above figures are subject to reduction in the case of certain individual animals and in the case of districts in which the breeding will be confined to a short season.

6. All grade male progeny of association sires must be castrated before they reach the ages indicated as follows:—

Colts, 15 months.

Calves, 6 months.

Lambs, 1 month.

Pigs, 6 weeks.

7. The Board of Directors shall, subject to the approval of the Live Stock Commissioner, select the man or men in whose charge the sires will be kept. In no instance, save in the case of rams, shall the secretary of an association act as caretaker of an animal loaned to the association by the department.

8. Each party so chosen shall sign in triplicate, an agreement with the directors. The necessary blank forms will be supplied by the branch.

9. One copy of this agreement should be retained by the secretary and one by the caretaker, the other copy being forwarded to the Live Stock Branch to be placed on file.

10 It is the duty of the directors, through the secretary, to see that the terms of their agreement with the caretaker are carried out. It should be understood that in no case does the department enter into official relationship with the caretaker. In the event of an officer of the branch finding that the caretaker is not living up to his agreement, it is with the secretary that the matter will be taken up, either through the inspector or by correspondence direct from the department.

11. It shall be the duty of the secretary of the association, upon being notified of the sickness or death of an animal, to communicate such fact immediately to the Live Stock Commissioner.

12. The Board of Directors shall make all arrangements regarding service fees with the party or parties in whose charge the sires are placed. Such service fees shall be sufficient to cover the cost of the care and management of the animals, including veterinary attendance, and, in the case of stallions also the insurance.

13. Each association shall, on or before February 1 of each year, forward to the Live Stock Commissioner a full report of the affairs of the association for the preceding year, covering the following points:—

List of members of association and their addresses.

Itemized statement of receipts and disbursements.

Copy of service record showing number of animals bred, the name of the owner in each case, the date of service and the fees charged, together with any other information which may be specially requested by the Live Stock Commissioner.

14. The membership fee of one dollar provided for under article (3) of the constitution must be collected annually from each member of the association. All money so collected remains in the hands of the association to cover incidental expenses and cost of veterinary attendance which may be found necessary throughout the year. In the case of small associations it is advised that during the first year at least no money collected as membership fees be applied on the cost of maintenance of any animals loaned to them.

Regarding the distribution of rams and boars, it is significant to observe that uniformity of type in a district is being attained by means of this assistance. This is a feature to which not sufficient stress has been paid in America, and concerning which we can learn much from Europe and do well to adopt its methods in this respect. The branch restricts an association to the loan of one breed of each class, and further applications must be confined to the original selection.

RECORD OF PERFORMANCE.

The Record of Performance of pure-bred dairy cows continues to grow in popularity and extend its scope both as regards the number of animals for which applications are received and which qualify for entry. During the year, applications were presented from breeders in all the provinces of the Dominion, Manitoba having been included in the itinerary of the inspectors some months since. Owing to the extension of the territory and to the increase in the number of entries, it has been necessary to add two additional permanent inspectors to the staff.

NUMBER OF COWS FOR WHICH APPLICATIONS HAVE BEEN RECEIVED.

Holstein.. .. .	641	—Increase as compared with preceding year.. ..	75
Ayrshire.. .. .	487	“ “ “	123
Jersey... .. .	159	“ “ “	44
Guernsey.	30	“ “ “	15
French Canadian.	17	—Decrease “ “ .. .	16
Shorthorn	77	“ “ “	13
Total	1,411	—Increase “ “	228

Holstein.. .. .	196	—Increase as compared with preceding year.. ..	31
Ayrshire.. .. .	123	“ “ “	4
Jérsey... .. .	35	“ “ “	5
Guernsey.	9	“ “ “	7
French Canadian	14	“ “ “	12
Shorthorn	36	“ “ “	27
Total	<hr/> 413	“ “ “	86

10,140 pounds milk; 413 pounds butter fat.

FEDERAL ASSISTANCE TO HORSE BREEDING.

3. The secretary of the club shall forward to the Live Stock Branch, with the regular application, a list of its members, also a copy of the memorandum of agreement signed by both parties interested. This agreement shall not become binding until approved by the Live Stock Commissioner.

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4. The minimum service fee shall be not less than twelve dollars.

5. All service fees shall be collected by the club.

6. Payment of service fees shall be made as follows: One-third of the service fee for each guaranteed mare shall be paid by the club to the stallion owner at the end of the service season.

7. The remaining two-thirds of each service fee shall be paid when the mare proves to be in foal. That is to say, the remaining two-thirds shall be paid for only such mares as prove to be in foal.

8. At the end of the service season the stallion owner shall furnish the Live Stock Branch with a sworn statement setting forth the number of mares bred to his horse, and the name of the owner of each.

9. The Live Stock Branch shall pay the club an amount equal to 25 per cent of the total amount paid at the close of the service season on the full number of guaranteed mares, on receipt of the stallion owner's statement and of a properly audited and sworn statement signed and declared by the president and secretary.

10. The Live Stock Branch shall pay the club a second grant equal to 25 per cent of the amount paid to the stallion owner on the total number of mares that prove to be in foal, that is, 25 per cent of two-thirds the service fee paid for each mare that proves to be in foal, on receipt of a properly audited and sworn statement signed and declared by the president and secretary of the club.

To the end of the fiscal year, two hundred inquiries have been received asking for information respecting the provisions of this new policy. Prominent breeders have expressed the opinion that this scheme would serve to direct horse-breeding operations throughout the country in a more systematic and progressive manner than has hitherto been adopted. A number of clubs have already been formed for the purpose of hiring stallions, and it is expected that several applications will be received before the beginning of the service season.

EGG AND WOOL EXHIBIT.

A very complete and instructive exhibit, under the supervision of the Sheep and Poultry Divisions of the Branch, was displayed at practically all of the larger western fairs, and at a considerable number of fairs in Eastern Canada. The wool exhibit illustrated samples of native-grown wool, and the processes of manufacture from the wool to the cloth. The egg exhibit pointedly drew attention to the loss sustained by faulty methods in production and marketing, and to the improvement that might be effected by the adoption of a more practical and scientific system. In addition, candling demonstrations were given for the instruction of the public generally, as regards quality in eggs.

Arrangements were made with the Canadian Pacific Railway for the loan of a large express car, and, in addition to the display of the exhibit in Western Canada, demonstrations were given at eighty-five points on the main line of the Canadian Pacific and Intercolonial railways in the provinces of Ontario, Quebec, New Brunswick, and Nova Scotia. The following table gives a brief statement of the number

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of people who viewed the exhibit and who actually attended and took part in the demonstrations given in connection therewith:—

Western fairs..	45,000
Miscellaneous, Eastern Fairs, including the Canadian National..	76,000
Demonstration car points on lines of Canadian Pacific railway..	24,000
Demonstration car points on lines of Intercolonial railway.	7,500
<hr/>	
Total..	152,500

Although 1914 was the first year in which assistance of this nature was granted to sheep raisers, and the scheme was not actually formulated until the shearing season in Eastern Canada had virtually commenced, a number of flourishing associations were organized and took advantage of it. The results show not only the benefits to be gained through co-operative effort in marketing, but also the greater financial returns derived from the presentation to the trade of a clean classified article. The grading was pursued under the instruction and supervision of the wool experts of the branch, and the wool was disposed of through avenues devised and controlled solely by members of the different societies. Grading increased the price of wool fully 4 cents a pound.

Most of the actual grading in an organized fashion was performed in the western provinces. Wool classifiers of the branch were utilized, however, in giving lectures and demonstrations and providing general assistance with respect to the preparation of wool to sheep raisers in Ontario, Quebec, and the Maritime Provinces. Their services were in constant demand, and a corollary of their efforts has been the abolition of the system of tubwashing in some districts, and the establishing of plans for the organization of several Wool Growers' Associations.

AMOUNT OF WOOL GRADED FOR EACH ASSOCIATION AND AVERAGE PRICE PER POUND.

Name of Association.	Amount of wool.	Average price per pound.
	Lb.	Cents.
Pontiac, Que.	7,212 $\frac{3}{4}$	20 $\frac{1}{4}$
Manitoulin, Ont.	15,742	20 $\frac{3}{4}$
Manitoba.	44,059	20
Calgary	6,942	19
Medicine Hat.	60,231	19 $\frac{1}{2}$
Bassano.	27,840	21 $\frac{1}{2}$
Carstairs.,	11,039 $\frac{1}{2}$	19
Lacombe.	9,935	19 $\frac{1}{2}$
Central Alberta.	18,216	21

THE EGG TRADE IMPROVEMENT CAMPAIGN.

Following the success that attended the efforts put forth in this direction, during the preceding year, the work has been extended to the maritime and to the western provinces. The progress which has already been made is significantly illustrated in

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the very wide adoption, particularly in the province of Ontario and, to some extent, in Quebec, of the policy of loss-off buying, as contracted with the old case-count system, and in the attention which has been directed to the benefits of quality payment. The egg trade investigation has revealed the presence between the consumer and producer of a large class of egg buyers who have known little regarding the quality of the eggs which they handled. It should be made clear, of course, that this statement is in reference not to the wholesale trade, as such, but to the unorganized class of buyers who secure the product direct from the farmer. The campaign in the interests of improved systems of marketing is steadily obliging the egg buyer to further study the subject and to systematize and make more practical his method of handling eggs. The outcome of this movement should prove of economical advantage to the producer, and greatly reduce the loss finally charged against him resulting from wasteful unbusinesslike practices.

The action of the Canadian Produce Association at their convention, held at the Agricultural College, Guelph, January last, in adopting definite standards for Canadian eggs, will undoubtedly lead to marked improvement in trade conditions, as they may be expected to provide a definite and established basis upon which to inaugurate a system of quality payment.

EGG CIRCLE ORGANIZATION.

The most marked developments in this work have taken place in the provinces of Prince Edward Island and Ontario. In Prince Edward Island some twenty additional circles have been organized, the total of associations now being sixty-two, with a membership of between five and six thousand farmers. During the calendar year ended December 31, 1914, the product of eggs passing through the hands of the circle organizations aggregated in value \$300,000, the price received being considerably in advance of the prices which would have been obtained through ordinary channels. A pronounced feature of this work lies in the fact that, since the farmers' association has entered upon the movement, the competition created has resulted in a distinct advance in price throughout the whole province, the campaign undertaken by the department having netted to all the farmers of Prince Edward Island, non-members as well as members, an increase of many thousands of dollars in excess of what would have been realized at current prices prevailing before the movement started.

In Ontario and Quebec, while progress, owing to the fact that farmers have not laboured under such a serious handicap, has not been so marked, there have been organized twenty-six associations, with a membership of 1,162, the value of the eggs co-operatively marketed approximating \$80,000. In view of the tremendous development of the poultry industry in the western provinces, a systematic campaign with regard to the co-operative sale of eggs in that portion of the Dominion is now being arranged.

PATRIOTISM AND PRODUCTION.

In the French-speaking districts of Quebec the Agricultural Conferences held in connection with the Patriotism and Production campaign were arranged by the Live Stock Branch, and at 114 meetings, included in the first series, the attendance averaged

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at least 200. It is reported that, in certain districts, the numbers present ranged from 300 to 800 people, and it is stated on good authority that these were the most effective Agricultural Conferences ever held in the province, the numbers of people present being 60 per cent in excess of the average attendance at rural conferences on other occasions. The interest on the part of the farmers was very keen, and evidently represented a desire on their part to meet the situation which was presented to them in an earnest and patriotic way. Large numbers of ladies were present at each meeting. The success of the campaign may be attributed in no small degree to the co-operation of the clergy of all denominations, and particularly of the curés of the various parishes. The publicity given the work in Quebec was due very largely to their efforts and, through their attendance at the meetings, and the appropriate addresses which they delivered, the movement for increased production in the province received a very strong impetus.

PUBLICATIONS.

In this branch, the following publications have been issued during the year:—

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| Pamphlet | No. 1.—“Advantages of Sheep Raising.” | By T. R. Arkell. |
| “ | No. 2.—“Preparing Wool for Market.” | By T. R. Arkell. |
| “ | No. 3.—“Wool and its Manufacture.” | By T. R. Arkell. |
| “ | No. 4.—“Advice to the Beginner in the Selection of Breeding Stock.” | By T. R. Arkell. |
| “ | No. 5.—“Care of the Ewe and Lamb.” | By T. R. Arkell. |
| “ | No. 6.—“Advantages of Dipping.” | By T. R. Arkell. |
| “ | No. 7.—“Practical Assistance to Wool Growers in the Marketing of their Wool Clips.” | By T. R. Arkell. |
| “ | No. 8.—“Care of the Ram and Ewes during the Breeding Season.” | By T. R. Arkell and Norman Stansfield. |
| “ | No. 9.—“Advantages of Docking.” | By T. R. Arkell and Norman Stansfield. |
| Leaflet | No. 1.—“Rules for the Production and Marketing of New-Laid Eggs.” | By W. A. Brown and J. H. Hare. |
| “ | No. 2.—“The Importance of the Removal of Male Birds after the Breeding Season.” | By W. A. Brown and J. H. Hare. |
| “ | No. 3.—“Suggestions for Egg Circle Members.” | By W. A. Brown and T. A. Benson. |
| Pamphlet | No. 3.—“The Candling of Eggs.” | By W. A. Brown and W. H. Ault. |
| “ | No. 4.—“The Organization of Co-operative Egg Circles.” | By W. A. Brown, B.S.A. |
| “ | No. 5.—“Plan of Permanent Laying House for Poultry.” | By W. A. Brown and T. A. Benson. |
| “ | No. 6.—“The Payment for Eggs According to Quality.” | By W. A. Brown, J. H. Hare and W. H. Ault. |
| “ | No. 7.—“The Egg and Poultry Situation in Canada.” | By W. A. Brown, B.S.A. |
| Report | No. 6.—“Canadian Record of Performance.” | |
| Bulletin | No. 17.—“Swine Husbandry in Canada.” | By J. B. Spencer, B.S.A. |

The popular interest in these publications is evidenced by the large number which have been distributed, the major portion being sent out in response to individual requests. The attractive new bulletin edited by Mr. Spencer, and the short, concise, pithy pamphlets issued by the Sheep and Poultry Divisions respectively, have been in special demand. Particular mention should be made of the distribution of cardboard egg candling appliances, of which approximately 100,000 have been sent out upon request.

DOMINION EXPERIMENTAL FARMS AND STATIONS.

The activities of the Experimental Farms Branch during the year 1914-15 may be classified under three heads, namely, the continuation of experimental work already under way, the inception of new lines of experiment, and the establishment of additional Experimental Stations.

The year was a busy one in all these directions. Experimental work in animal husbandry, field husbandry, cereals, horticulture, forage plants, chemistry, botany, poultry raising, bee-keeping, and tobacco culture was actively pursued, although the field work was carried on under unfavourable conditions in many sections of the Dominion, owing to the prolonged drought. The results obtained in cereals, field husbandry, horticulture, and forage plants have already been published in summary form. Notes on a few features of the season and the work will be found farther on in this report.

Additions in area have been made to the Experimental Stations at Fredericton, N.B.; Rosthern, Sask.; and Scott, Sask.; which will permit of considerable extension of the work formerly carried on at those points.

Last autumn an Experimental Station was established at Summerland, B.C., and in March of this year another was located near Morden in southern Manitoba. At the former station the growing of crops under irrigation will be a main feature, while at the latter, horticulture for the Prairie Provinces will be given special study.

The organization and expansion of the work, both at the Central and branch Farms, has been greatly hampered by delay in getting necessary buildings erected. This has been felt more especially in the case of the animal husbandry work. It has been possible to build only some small workmen's cottages, poultry houses, etc., which were put up by day labour. The new barn at the Central Farm, also built by day labour, was finished during the year, and is undoubtedly one of the very best barns in Canada on the scores of convenience, light, ventilation, and hygienic conditions generally.

Although for some years past it has been the custom to make a small Experimental Farm exhibit at a few local fairs, this work was given special attention during this year. Several circuits of fairs were made up and an exhibit sent round each. The work was under the immediate supervision of Mr. J. F. Watson, of the Central Farm staff, and marked interest was aroused and success obtained. It is planned to still further enlarge this work during the coming year.

With the co-operation of the Publications Branch, an effort has been begun to increase greatly the mailing lists of the department, and it is hoped that by the close of the coming year, we shall be able to report a much larger list, made up entirely of those really interested in our publications.

In January last, a conference of superintendents and Central Farm officers was held. The main lines of present and proposed experimental work were discussed and planned, and the meetings, without doubt, did much towards making clear the aims of the Experimental Farms Branch and fostering a spirit of co-operation among its officers.

The following publications have been issued during the year, or are in the press at its close:—

In the Regular Series—

- No. 78.—The Ventilation of Farm Buildings, by J. H. Grisdale and E. S. Archibald.
- No. 79.—The Renovation of the neglected Orchard, by M. B. Davis.
- No. 80.—Lime in Agriculture, by Frank T. Shutt.
- No. 81.—Summary of Results in Cereals, 1914, by C. E. Saunders.
- No. 82.—Summary of Results in Horticulture, 1914, by W. T. Macoun.

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In the Regular Series—*Continued.*

- No. 83.—Summary of Results in Field Husbandry, 1914, by W. Graham.
 No. 84.—Summary of Results in Forage Plants, 1914, by M. O. Malte.
 No. 85.—Hardy Roses, their Culture in Canada, by W. T. Macoun and F. E. Buck.

In the Second Series of Bulletins—

- No. 17.—Forest Insect Conditions in British Columbia, a Preliminary Survey, by J. M. Swaine.
 No. 18.—The Strawberry Root Weevil in British Columbia, by R. C. Treherne.
 No. 19.—The Planting and Care of Shade Trees, by F. E. Buck.
 No. 20.—The Farmer as a Manufacturer, by A. T. Stuart.
 No. 21.—Tobacco Growing, by F. Charlan.
 No. 22.—Growing Field Root, Vegetable and Flower Seeds in Canada, by M. O. Malte and W. T. Macoun.
 No. 23.—Medicinal Plants and their Cultivation in Canada, by J. Adams.

Circulars issued—

- No. 6.—Regulations under the Destructive Insect and Pest Act, governing the Importation, Sale, Shipment and Exportation of the Common or Irish Potato, by H. T. Güssow.
 No. 7.—Potash in Agriculture, by Frank T. Shutt.
 No. 8.—Manures and Fertilizers, by Frank T. Shutt.
 No. 9.—The Control of Potato Diseases, by H. T. Güssow.

Pamphlets issued—

- No. 13.—The Home Vegetable Garden and a Patriotic Gardening Competition, by W. T. Macoun.

In addition to the above, the first number of "Seasonable Hints" was brought out and attracted favourable notice. The main object in view in issuing this publication is to give the farmer notes of our results, or advice in regard to his farm work, more promptly than is possible through the medium of our reports and bulletins. It is not proposed to bring the "Hints" out at fixed intervals, but rather at such times as it is thought that it will prove of immediate value to the farmer in the work then occupying his attention.

In connection with the Exhibition work, a large number of Exhibition Circulars were published last season. These covered most of the principal lines of agricultural effort. New editions of these are being prepared for the coming exhibition season, and further circulars brought out as well.

DOMINION EXPERIMENTAL FARMS' EXHIBIT.

In the past, the Central Experimental Farm and some of the branch Farms and Stations have, when requested by exhibition managers, made a display at exhibitions and fairs in their respective localities; but until this year no organized programme has been followed in this connection. Furthermore, such exhibits as have been made have been more in the nature of a general display, principally to make known the existence of the Experimental Farms system, and representing the products of the particular Farm exhibiting. From inquiries made and questions asked by interested visitors at the exhibitions, there is evidence of the general desire for practical information on all lines of farm work. To meet this demand, early in the spring of 1914 the subject was brought under consideration, and it was decided to carry out an organized programme in the matter of attending exhibitions and fairs, with the object of not only making known the location of the Experimental Farms and Stations and the work they are doing, but also to make the exhibits educational and representative of the various lines of work being undertaken by the several divisions of the Central

Farm, as well as the branch Farms and Stations. Under the supervision of the Director of the Dominion Experimental Farms, Mr. J. F. Watson, of the Central Farm staff, was given charge of the work of bringing together representative exhibits from the various divisions of the Central Farm and the carrying out of the programme of attendance at exhibitions. The plan of organization adopted provided for assembling at the Central Farm five complete exhibits—each in charge of a practical man (either an Agricultural College graduate or student)—one for each of five circuits which included the principal exhibitions and fairs throughout the Dominion.

In accordance with this plan a Dominion Experimental Farms exhibit, including an exhibit from the branch Farm nearest to the place of exhibition, was shown at the following exhibitions: Shubenacadie, N.S.; Sydney, N.S.; St. John, N.B.; Charlottetown, P.E.I.; Quebec, Que.; Three Rivers, Que.; Sherbrooke, Que.; London, Ont.; Ottawa, Ont.; Winnipeg, Man.; Brandon, Man.; Regina, Sask.; Prince Albert, Sask.; Saskatoon, Sask.; Calgary, Alta.; Lethbridge, Alta.; Medicine Hat, Alta.; Vancouver, B.C.

From the reports received from exhibition managers and visitors, and from our own superintendents, we have evidence that the work this year in connection with exhibitions was productive of excellent results, and arrangements will be made to attend a larger number of exhibitions and fairs during 1915.

DIVISION OF FIELD HUSBANDRY.

The aim of this division is to grow maximum crops at a minimum cost of production.

The work is practical in nature, including the following investigations now in operation on the various Farms and Stations throughout the Dominion:—

1. The investigation of the relative merits of different crop rotations. At the Farms and Stations in Eastern Canada and the province of British Columbia, the different rotations being tested are suitable to conditions where dairy or live stock farming is the line engaged in. For the prairie Farms and Stations the rotations are planned more particularly for the production of grain, as this branch receives as yet the special attention of the majority of farmers. In addition, a number of mixed-farming rotations are being tried to provide fodder crops for those who appreciate the advantages to be derived from a system which includes live stock and a variety of crops.

2. The study of methods of soil cultural treatment. To determine the cultural treatment best suited to the dry prairie soils, a series of soil cultural experiments were inaugurated and have now been running for four years at the six prairie Farms and Stations. The object of these experiments is to determine the best means of conserving moisture and soil fertility, and in the control and eradication of weeds.

3. The determining of the cost of production of field crops under ordinary farm conditions.

4. The demonstration of the value of underdrainage and irrigation.

5. The testing of different implements as to influence of size and character on the cost of production.

6. The comparison, to a limited extent, of various grains and forage crops as producers of food for live stock.

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CHEMICAL DIVISION.

The work of the year, in its essential features, has been similar to that of the past, and has been carried on with the two-fold object in view—investigation and education. By the attack of problems affecting Canadian agriculture, some new facts have been added that must prove of service in the economic development of our basic industry, and by the dissemination of information through correspondence, bulletins, and reports, much assistance has been rendered the farmer that should be useful in the conduct of his everyday work. In all the activities of the division, the endeavour has been to keep in close touch with the man on the land, and study his difficulties and, in so far as it is possible by chemical means, to find a solution to the numerous questions that are constantly arising in the management of soils and the increase of their fertility, in the growth of crops and in the feeding of stock. No research has been undertaken that has not had for its object an immediate and practical end in view, one that might yield results that would be of service to agriculture as it is now practised in one or other of the districts throughout this wide Dominion.

In connection with the campaign "Patriotism and Production" that has been carried on throughout the Dominion during the early months of the present year, a number of special articles and bulletins have been written on subjects pertaining to agricultural chemistry. These, for the most part, have been brief accounts, couched in simple language, of the various means within the reach of the farmer for the maintenance and increase of soil fertility. The titles of the three more important publications issued as circulars or bulletins of the Experimental Farm are: "Potash in Agriculture," "Lime in Agriculture," and "Manure and Fertilizers." It may be added that there has been a marked response on the part of the farmer to the announcement in this campaign that all possible help would be afforded him through information and advice; the correspondence of the division has increased considerably by reason of this appeal or offer during the past three months.

During the year, 3,829 samples have been received and entered for examination or analysis. Many of these have been collected in connection with our own investigations, but the number sent in by farmers is very large. As far as time permits these latter are examined and reported upon. Every effort is made to furnish these correspondents with the information they desire with as little delay as possible, but necessarily in such times as these, when the work is not only increased but the staff has suffered through enlistments for active service, it has been impossible to attend to all demands as promptly as might be desired.

The number of samples submitted for chemical and microscopical examination by the Meat Inspection Division Health of Animals Branch, for the year just closed, has been 662. This is a very considerable increase over the number of the previous year, and has necessitated the appointment of further expert assistance for the satisfactory accomplishment of the work involved. The samples comprise preserved meats, condiments and species, dyestuffs, preservatives, etc., etc., collected at the various packing houses in Canada, the examination being made with a view of determining their nature, purity, and character of adulteration, if present.

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An enumeration of the more important investigations that have been carried on during the year may be given as follows:—The analysis of soils from large and yet uncropped areas in Western Canada; the determination of the “alkali” in soils in certain areas in Alberta with a view of determining the suitability of such lands for cultivation; the influence of cultural operations and various systems of cropping on the soil moisture of lands in districts of sparse and uncertain rainfall; the influence of climatic and soil conditions on the quality of wheat; the relative feeding value of field roots; the value of sugar beets for factory purposes as grown in various parts of the Dominion; the character of the water supply as found on Canadian farm homesteads; the fertilizing value of rain and snow as measured by their nitrogen content; the potash and nitrogen content of the seaweeds on the Pacific and Atlantic seacoasts, and the manufacture of a fertilizer by the drying and grinding of seaweed.

DIVISION OF HORTICULTURE.

The work of the Horticultural Division, as of other divisions of the Experimental Farms Branch, is not confined to the Central Farm at Ottawa but extends over the whole system of Experimental Farms, hence it is desirable from time to time to draw attention to the work at the branch Farms and Stations. Certain uniform varietal and cultural experiments with fruits, vegetables, and ornamental plants are carried on at practically all the Farms and Stations, the object being to obtain results which when compared will show the influence of the climate and soil in different parts of Canada on varieties and on methods of culture. Very valuable information has thus been and is being accumulated, which is available both to new settlers and to those who have been living some time in a district served by an Experimental Farm. This information when used by the settlers saves much loss from buying unsuitable plants and from adopting cultural methods which are not the best for a particular kind of climate or soil.

While the Experimental Stations may be divided into Maritime, Eastern, Prairie, and Western Farms, it is found that so far as horticulture is concerned the climate at each Farm and Station throughout the Dominion is sufficiently different to make the work of each Station of special value to the district it serves.

In 1914 the Dominion Horticulturist visited the branch Farms and Stations, as in other years, and discussed the horticultural work with the superintendents, and rendered what help he could.

At the Experimental Station at Fredericton, N.B., which is a comparatively new one, 11 acres of orchard were set out in 1914, consisting of apples, pears, plums, and cherries. Bush fruit plantations were also established and varietal and cultural experiments with vegetables and flowers continued. It is expected that the work with apples will prove of particular value at this Station as the St. John River Valley is admirably adapted to certain types of dessert apples, and it will be the endeavour to obtain additional varieties which will extend the season of high-class fruit. To this end the new varieties originated at the Central Farm are being thoroughly tested. The potatoes grown in New Brunswick have already made a name for themselves, and particular attention is being paid to this crop at the Fredericton Station. A large

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collection of varieties was tested in 1914, and various methods of culture are being tried. Some of the varieties tested in 1914 proved considerably more productive than the Green Mountain, which is the variety generally grown.

The plantations at the Experimental Station at Kentville, N.S., were extended in 1914. With the many cultural experiments which are under way here this Station should in a short time prove of great value to the fruit grower of the Annapolis and adjacent valleys. As there were practically no bearing trees on this Station when it was established, and as spraying and thinning experiments covering a number of years seemed badly needed, orchards at Falmouth, Berwick, and Bridgetown were rented, and during the past two seasons a series of experiments have been conducted which already have given some valuable results especially in regard to the time of spraying.

At Charlottetown, P.E.I., and at Nappan, N.S., hardier fruits are required than at Kentville, and these Farms are showing that if the proper varieties are planted good returns can be obtained from fruit.

The Experimental Stations at Cap Rouge and Ste. Anne de la Pocatière, Que., have already good orchards established, and at the former Station a number of apple and plum trees fruited in 1914, although the orchards are very young. At Cap Rouge, considerable attention is being paid to the selection of home-grown vegetable and flower seeds. Samples of the seed were sent out for trial in the province of Quebec in 1914 with gratifying results.

While the Experimental Station at Lennoxville, Que., was established too recently to do much in horticulture in 1914, preparation was made for the work of 1915, when orchards and other plantations will be set out. A nursery was, however, established in order to have plants ready for the permanent planting. Some work in the selection of potatoes was also carried on.

On the six prairie farms, the horticultural work is being pursued with vigour, and much valuable information accumulated. At Lethbridge, Alta., apple trees are standing the climate very well, and in 1914 such hardy varieties as Yellow Transparent, Duchess, Charlamoff, Hibernial, and others bore fruit. The trees are thrifty and give promise of continued crops. At the other Farms and Stations, results with apples have not been so favourable. Crab apples have, however, fruited at all the prairie Farms, and as these hybrids require little or no protection by windbreaks they are a great boon to the settlers. Small fruits do well, and the prairie Farms are noted for their small fruits, fine vegetables, and beautiful flowers.

At Invermere, B.C., the results of the work for 1914 showed that excellent vegetables could be raised there, that small fruits promised well, and that the hardier varieties of apples withstood the winter of 1913-14.

The horticultural work at the Experimental Farm at Agassiz is now somewhat limited. The collection of ornamental trees and shrubs containing many species tender in most parts of Canada, and under test for from twenty to twenty-five years, is a good demonstration of the mildness of the climate, though the experience in the past with tree fruits shows that care must be exercised in the planting of varieties. A farmer's fruit plantation established in 1913, and containing the varieties which

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experience had shown were best adapted to this climate is a feature of this Farm. The trees and bushes in this did well in 1914.

Much horticultural work was accomplished at the new station at Sidney, Vancouver island, in 1914. Land which had been in heavy timber little more than a year before had been brought into good condition, and about 15 acres were planted to fruit in 1914. Owing to the very mild climate of this part of British Columbia, fruits are being tested which would not succeed where there was much frost. Apples, peaches, pears, plums, cherries, apricots, nectarines, quinces, persimmons, figs, and even citrous fruits are being tried; while among nuts the English walnut, chestnut, filbert, and almond are being grown. A plantation of English holly was set out, as the berries of the holly are in great demand in the winter, and bring good prices. A small plantation of the Cascara (*Rhamnus Purshianus*), which is a native of British Columbia, was also put out to learn how long it takes for it to reach marketable conditions. Many other economical plants are being tried. It is planned to have at this station as complete a collection as possible of the trees and shrubs of North America, and a good beginning was made in the establishment of this in 1914.

At the northern substations, such as Fort William and Grand Prairie in the Peace River district and at other places farther north, much useful information in regard to most suitable varieties is being obtained that will prove of much value to settlers as they come into these new districts.

The work at the Central Experimental Farm, Ottawa, is constantly growing with the addition of new Farms, but apart from the attention required in connection with these, an increasing amount of experimental work is going on at this farm itself. The new greenhouses to which reference was made last year have proved very satisfactory. One of the most interesting tests made during the past year in these houses was one with European grapes in large pots. The vines bore well, and good fruit was ripened. A Black Hamburg vine yielded over 10 pounds of good grapes. The advantage of having the vines in pots is that in small greenhouses where space is valuable the vines, after fruiting, may be put outside and later stored in a cellar for part of the winter, thus making the space they occupied available for something else. Such crops as tomatoes, lettuce, raddish, cauliflower, melons, cucumbers, and beans were grown to obtain information as to the best varieties and methods of culture. A very fine show of chrysanthemums of the best varieties attracted much attention in the autumn.

Fire pots have been used for some years in western orchards in the United States where frosts at blooming or ripening time are liable to occur, in order to raise the temperature in the orchard, and prevent frost. Some 400 of these were obtained for the Central Farm in 1914, and tests were made, the object being to prevent frost in truck crop and strawberry plantations. While the frosts in 1914 did not come when it was possible to demonstrate the saving of a crop by this means, the experiments showed that it was possible to raise the temperature sufficiently, and further experiments will be continued in 1915.

Autumn-bearing strawberries have been advertised for a number of years, but until recently there were none which seemed worthy of recommendation, but the

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Progressive, a comparatively new sort, gave such good results in 1914 that it merits attention. On a small plot which yielded at the rate of 9,982 pounds per acre, 5,649 pounds ripened between July 22 and September 25, after the regular strawberry season was over.

A small orchard of Wealthy apple trees planted 10 by 10 feet apart in 1896 has given some very interesting results, and shows the possibility of profitably treating some early-bearing varieties of apples in this way. The total net profits per acre for the nineteen years 1896-1914 are \$1,719.28, or an average per year of \$90.49. The trees have been thinned from time to time, the least productive being removed, and there are now less than half there were nineteen years ago.

The work in plant breeding was continued in 1914. In addition to the many promising new apples now fruiting as the results of past work, the results with early vegetables have been very gratifying, and the continued development of better varieties is anticipated. The ornamental grounds at the Central Farm are becoming more attractive every year, and the large collections of flowers which are available for study are much appreciated. Through the Horticultural Division much is being done to get Canadians to have a desire for more beautiful homes and, with more beautiful houses, we shall have a more attractive Canada. .

CEREAL DIVISION.

On the whole, the season of 1914 was not very favourable for cereal crops in Canada, because of the severe drought which was experienced over large areas of country. Western Quebec and eastern Ontario were very dry during the early part of the season, and southwestern Saskatchewan and southeastern Alberta suffered acutely throughout the whole summer. Those districts which had a moderate or good supply of rain gave excellent crops, especially central Alberta, southwestern Ontario, and parts of the Maritime Provinces.

The crops on most of the Experimental Farms and Stations were good, the methods of seed selection, soil cultivation, etc., employed being such as to reduce to a minimum the damage caused by drought or other unfavourable weather.

Experimental work with cereals was, of course, somewhat interfered with by the abnormal conditions, but valuable results were obtained, nevertheless, at all the Farms.

MARQUIS WHEAT.

Marquis wheat, though still a comparatively new variety, having been introduced by the Dominion Cerealists in 1909, has now for the fourth time in succession won the highest possible award on this continent in international competitions. The latest victory in the series was at the Dry Farming Congress at Wichita, Kansas, last autumn, when an exhibit of Marquis grown by Mr. Seager Wheeler at Rosthern, Sask., was given the highest score. Marquis now holds, almost undisputed, the first place among varieties of spring wheat in Canada. It is also highly esteemed in some of the United States which touch the Canadian border, and it has given an excellent account of itself in Colorado, at high altitudes, where early-ripening varieties are needed.

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PRELUDE AND PIONEER WHEATS.

These two very early-ripening varieties which have only been before the public for a short time have shown themselves very well adapted for districts for which there hitherto been no suitable sort. Prelude, by its extraordinary earliness, makes wheat growing profitable in localities where ordinary varieties are almost always damaged by frost late in August; and Pioneer, though a less useful sort, is the only very early wheat yet introduced which is at all suitable for dry districts.

OTHER GRAIN.

The production of new varieties of grain other than spring wheat is not making such rapid progress, but very many new sorts of barley, peas, oats, and flax are on hand; and excellent results are looked for, as soon as these new sorts shall have been sufficiently studied to ascertain which will best meet the needs of the farmers.

CROSS-BREEDING AND SELECTION OF CEREALS.

The foundation work of cross-breeding and selecting cereals is being continued as usual at Ottawa. Among the most interesting new types recently produced may be mentioned a series of beardless barleys, the characteristics of which are most unusual. It is hoped that some of these new sorts will prove valuable. In wheat, the latest crosses made have had in view the production of still better types of the earliest ripening habit, aiming especially to eliminate the tendency to shed the grain under the influence of high winds.

MILLING AND BAKING.

The researches in milling and baking have included the usual extensive tests of new kinds of wheat. No new variety is introduced from Ottawa until it has proved itself of very high baking strength in at least two seasons, when grown in different climates.

The studies of the effects of storage on flour have also been continued, and experiments have been conducted with a view to obtaining more precise information in regard to the exact conditions necessary for the production of the best bread.

FREE DISTRIBUTION OF GRAIN AND POTATOES.

The usual annual distribution of small samples of seed grain and potatoes is being carried on this winter. Owing to the very dry weather last season at some of the farms where the seed grain was produced, the quality of part of the material for distribution is not quite so good as usual; but every effort is made to ensure that only grain of the very highest possible degree of purity is sent out. The grain is, of course, always cleaned by the best machinery known, and when necessary it is also hand picked, so that there can be no adverse criticism as to the freedom of the samples from weed seeds and foreign grains. This annual distribution is doing great good by promoting the cultivation of the best varieties of grain in pure condition.

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DIVISION OF BOTANY.

During the year of report, the staff of the Division of Botany devoted much time to the increasing number of inquiries for information, which is received every year from farmers and other persons interested in subjects relating to economic botany and plant diseases.

FARM WEEDS.

Among the more important subjects may be mentioned the identification of weeds and Canadian plants. The weeds sent in to us have been identified, and advice was given relating to the most practicable means of their eradication as far as known. The purity of the seeds of agricultural plants, i.e., their freedom from weed seed, which are being analyzed by a special branch of the department, has unquestionably been attended by good and satisfactory results, shown by the improvements of seeds offered for sale; but the persistence of certain noxious weeds and the longevity of weed seeds in the soil causing weeds to rapidly appear on newly-broken land or on arable land as soon as the plough is used thereon, make it desirable to study, with the least delay possible, the most practicable and effective means to rid the farms of the Dominion of the weed pest. A knowledge of successful methods for the extermination of weeds would add an immense amount to the wealth of the country.

During the summer, one of the members of the staff spent several weeks in the West collecting exhibition specimens of the common weeds of Western Canada. Seedlings of the same weeds were raised in Ottawa to obtain the various stages in their development. It is intended to prepare a comprehensive exhibit of the weeds of Canada, showing their life-history from seed to seed. It would be a great advantage to farmers were they able to recognize noxious weeds in their earliest stages of development, and not allow them to produce flowers and seeds. The earlier a weed is recognized to be harmful and is destroyed, the greater will be the saving of time and trouble, which are inevitable once the weed is firmly established. The specimens so far collected have been carefully preserved, and are being arranged for exhibition in a unique and original manner, which will prove most useful for the purpose. The number of weeds and wild plants identified during the year was 955.

DESTRUCTIVE INSECT AND PEST ACT.

It will be remembered that an embargo was laid, December, 1913, on Canadian-grown potatoes by the United States, when it was determined that a form of scab said to be not widely prevalent in the United States of America existed in some parts of Canada. In June, the Dominion Botanist was instructed to confer with the experts of the United States Department of Agriculture concerning any conditions, under which the embargo might be removed. It was agreed to remove the embargo subject to certain rather complicated regulations being enforced by the Dominion under above Act. These conditions required the delineation of the infected area and certification of all potatoes, after inspection of farms and of potatoes prior to shipment from such area. The enforcement of the condition required the immediate

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employment of nearly thirty temporary inspectors, besides a considerable expenditure in supplies. Previous to the passing of these regulations by an Order in Council, they were discussed with the most interested parties, i.e., the shippers of New Brunswick, who unanimously declared themselves in favour of same. The regulations were then duly passed, November 4, 1914. The inspectors appointed received a special training at the Central Experimental Farm, and inspection work began in December, 1914.

From December 13, 1914, to February 26, 1915, 49,343 bushels were certified for export to the United States. From the same date to March 31, 36,689 bushels of "First Grade" and 440,038 bushels of "table grade" potatoes were inspected and certified for Canadian points. In all, 526,070 bushels of potatoes have been examined and certified during these months, all from the province of New Brunswick. On February 26, a car of Canadian potatoes was rejected by the United States inspector at Boston for presence of powdery scab. On inquiry at Boston by an official of our department, it was learned that the official United States Potato Disease Inspector found two potatoes slightly affected with powdery scab after a search of seven hours. In accordance with the United States requirements governing the importation of foreign potatoes, the permits issued were cancelled, and further permits were refused. Since that date, no further export of Canadian potatoes took place to United States points.

From our experience with powdery scab in Canada and in Europe, and from the experience of other plant pathologists of repute in Europe, we are more inclined than ever to regard this disease as one of minor importance and not warranting any such drastic measures. The time will come, no doubt, when the United States authorities will change their attitude towards the disease, particularly since it has been discovered in the states of Maine and New York.

Owing to the large crop of potatoes both in Canada and the United States, the market for this commodity was unusually slow. The inspection, quite aside from the question of powdery scab, has been found to improve greatly the quality of potatoes, which will prove of benefit to the grower as well as the shipper.

Mr. John Adams, the Assistant Dominion Botanist, was absent for several weeks in Prince Edward Island, where he delivered a series of lectures explaining the nature of powdery scab and the new potato regulations.

EXPERIMENTAL AND OTHER WORK OF THE DIVISION.

A large number of specimens of diseased plants of all kinds and cultures were sent in for examination and advice. As a microscopical and cultural examination is necessary in most of the cases to determine the cause, it will be obvious that the staff's time was much taxed, when it is stated that some 400 diseased specimens have been examined. The experimental work connected with plant diseases included a series of experiments on potato diseases. The prevention of common scab, powdery scab, the investigation into the nature of other obscure potato diseases like mosaic, leaf roll, curly dwarf, and net necrosis form still a large part of the work of the scientific staff.

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The Dominion Botanist, during the month of July and part of August, participated with a number of plant pathologists in a field survey of potato diseases in the United States. Such visits prove to be of great value to the grower, who becomes more interested in this work, as he is instructed and gains the knowledge enabling him to recognize the diseases prevailing in his own cultures. A similar trip was made through New Brunswick, where such work is greatly needed. It is intended to extend this operation towards other localities and other agricultural and horticultural crops.

THE ST. CATHARINES FIELD LABORATORY.

The work of the laboratory under the able charge of Mr. McCubbin is proving of greater value every year. A very comprehensive study of the most common fruit diseases has been made and a very instructive bulletin on the subject is in the press. The advantage of being in close touch with the fruitgrowers and of demonstrating the control of any disease and of investigating the cause of diseases of more recent appearance under the eye of the farmer are being more and more realized. To prepare the ground for the intelligent understanding of diseases of plants, Mr. McCubbin has held a number of classes, explaining the nature of disease-causing organisms, their biology and the reasons for the control measures adopted. These meetings were very satisfactorily attended.

PUBLICATIONS.

The following publications have been issued or are in the press:—

Exhibition Circulars—

- No. 44. Potato Scab, by J. Adams.
- 45. Do you know your Weeds?, by F. Fyles.
- 46. Apple Scab, by F. L. Drayton.

Bulletins—Circulars—

- The Control of Potato Diseases, by H. T. Güssow. (Circular No. 9.)
- Medicinal Plants and their Cultivation in Canada, by J. Adams. (In the press.)
- Fruit-tree Diseases, by W. A. McCubbin. (In the press.)
- Regulations under the Destructive Insect and Pest Act governing the Importation, Sale, Shipment and Exportation of the Common or Irish Potato, by H. T. Güssow. (Circular No. 6.)

DIVISION OF FORAGE PLANTS.

The work hitherto carried out by the Division of Forage Plants has included:—

1. Variety tests, with the object of securing data bearing on the suitability or unsuitability for different parts of Canada, of already established varieties of the different groups of forage plants.
2. Breeding work, with the object to produce new varieties of forage plants superior to those already in existence and better suited to the various climatic and soil conditions existing in different parts of the country.

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3. Investigations, chiefly of a systematic nature on wild grasses and other plants forming parts of wild hay and pastures.

During the year, a new line of work has been taken up by the division, viz., production of seed of forage plants, and particularly of field roots.

VARIETY TESTS.

In order to eliminate, as much as possible, the disturbing influence of soil variation on the variety tests, it was decided, in 1913, to arrange all experiments in duplicate plots. The value of duplication has been demonstrated during the past two years, and, as far as the experiments at the Central Farm are concerned, more particularly so during the year 1914-15.

Through the duplicate-plot system, fairly reliable information on the comparative yielding capacity of different varieties has been secured.

The real value of a variety depends, however, not upon its yielding power alone, but also on its chemical composition. This is true especially of Indian corn and field roots. The real food value of a variety belonging to these groups of forage plants should therefore be calculated from tonnage and chemical composition, taken together. This method of determining the comparative food value of different varieties of field roots and Indian corn has been followed, during the year, at the Central Experimental Farm, and has already proven of great advantage.

BREEDING WORK.

The division has well under way breeding work with alfalfa, red clover, alsike clover, timothy, orchard grass, and a few other grasses.

Up to the present the breeding work with the clovers has mainly had for its object the production of perfectly hardy varieties, i.e., varieties able to come through the most severe Canadian winters without being wholly or partially killed. The methods used to achieve this object consist simply in a mass-selection and propagation of such forms and types which have been able to winter successfully under unfavourable conditions. The results already obtained indicate beyond doubt that by the propagation of such hardy types, varieties can be produced which, as far as hardiness and, as a result thereof, productiveness are concerned, far excel varieties now obtainable. They also indicate that home-grown seeds gives better crops than seed imported from somewhere else.

With a view of obtaining, not only hardy varieties of clover, but also uniform ones of superior yielding capacity, breeding has also been started from individual plants of red clover and alfalfa. This work which was started in 1913 is progressing very satisfactorily but, owing to its nature, no definite results can be expected until after several years.

The breeding work with grasses which was started in 1912 has for its object the production of high-yielding and uniform strains. At present seventeen "families" of timothy, each represented by sixty-five individual plants, secured through self-fertilization, are under observation. Many of the "families" display a remarkable uniformity in general appearance, while others seem to be uniformly resistant to drought and rust.

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FIELD ROOT SEED PRODUCTION.

With a view of improving old varieties of field roots by breeding, preparatory experiments were started with mangels and turnips on a small scale in 1914.

In 1914, when the conditions in the root seed producing countries of Europe threatened to make a normal supply of seed impossible, steps were taken to secure data bearing on the possibility of producing field root seed profitably in Canada. As large quantities as possible of suitable mangels and turnips were selected as seed roots for the year 1915.

HERBARIUM.

The herbarium material of grasses and kindred plants necessary for the proper understanding of the nature and merits of natural pastures, and of hay made from wild grasses, is steadily being increased. In addition to a vast collection of grasses made by the Dominion Agrostologist in Western Canada, about 800 sheets of European grasses and sedges were secured through exchange.

EXHIBITION COLLECTIONS.

About 1,400 exhibition specimens have been secured during the year. A large number, representing 175 different species, have been exhibited in the Canadian Pavilion at the Panama-Pacific International Exposition, San Francisco, California.

The balance have been left at the disposal of the Division of Extension and Publicity.

ANIMAL HUSBANDRY DIVISION.

This division of the Central Experimental Farm has, during the past fiscal year, continued to expand rapidly. The scope of work, briefly, is the laying out and superintending of the feeding, breeding, purchasing, management, and housing of farm animals; the manufacturing and marketing of their products, together with all routine and experimental work connected therewith, on the Central Experimental Farm; and, in consultation with the Director of the Experimental Farms and Superintendents, the supervision of similar work on the branch Farms and Stations.

The work on the Central Experimental Farm, Ottawa, during the past year has been somewhat handicapped by the lack of buildings. However, during the year the new buildings replacing those which were destroyed by fire in October, 1913, were completed. The work of planning these buildings and supervising the construction fell largely to the Dominion Animal Husbandman, under the direction of the Director of the Experimental Farms. This new building is eminently satisfactory, and illustrates a great many features of modern barn construction, both as to simplicity, economy, efficiency, and durability.

LIVE STOCK ON THE CENTRAL FARM.

The horses on this Farm are all of draught type, excepting the necessary drivers. Although the majority of the horses kept were geldings, yet an increasing number of mares are being maintained for breeding purposes. A number of these mares are in foal, and it is to be hoped that breeding operations may be successfully carried on.

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Beef cattle work has been discontinued for the time being, owing to the lack of proper buildings. This important work will be re-established as soon as it is found expedient to construct the necessary housing facilities both for breeding and feeding stock.

Dairy cattle continue to receive increased attention. Representatives of five breeds, namely, Ayrshire, French-Canadian, Guernsey, Holstein, and Jersey are maintained, all of which have shown excellent returns. Milk production was naturally largely diminished when the buildings were lost, but all herds are now built up to their normal strength. Many pure-bred animals from these herds are annually sold for a moderate price. It is the object of this phase of the work to distribute the best of pure-bred males in districts where the greatest amount of good may follow.

Many valuable breeding animals have again been furnished to the branch Farms in order to build up other herds and flocks. Experiments in breeding and feeding of dairy cattle have been rapidly extended, and many new and valuable phases of investigation work are being given attention.

The sheep on the Central Experimental Farm are very much improved, in numbers, quality, and condition. This marked improvement is again due to the utilization of farm roadsides for pasture. Although this method of pasturing sheep is somewhat more expensive than the open pastures, yet it keeps the roadsides in splendid condition. Owing to the limited area, only two breeds are maintained, namely, Shropshire and Leicester, and from these flocks a number of excellent breeding animals were distributed to the branch Farms and Canadian farmers.

Swine raising has again demonstrated itself as one of the best paying branches of the live stock work. Yorkshires, Berkshires, and Tamworths have been kept; from which herds again large numbers of young pure-bred animals have been sold for breeding purposes. A large number of feeding experiments have been conducted during the year. These experiments, dealing with milk substitutes, the economic values of farm and elevator products and by-products, and the like, will be of distinct value to many of the farmers in Canada.

Experimental work along the lines of producing and marketing dairy products has been conducted during the year. This department alone has shown gross receipts of over \$11,000 and, at the same time, in addition to the experimental work, has distributed a large amount of information to farmers.

NEW BARN, CENTRAL EXPERIMENTAL FARM.

The new cattle barn at the Central Experimental Farm includes the main barn and two wings to accommodate bulls and calves. Although this barn could not be considered a farmer's model barn, due to the fact that many arrangements are specially made for the carrying on of experimental work, nevertheless the modern features of an up-to-date economic barn are well illustrated. Many different types of fittings, floorings, dimensions, and arrangements, both for the cattle and for the handling of the foodstuffs, are being tried. In addition, two different makes of silos, namely, a home-made reinforced cement block and a vitrified clay tile, are being experimented with. In the course of another two years' use a large amount of data of economic value to the farmers will be available for distribution.

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ASSISTANCE TO BRANCH FARMS.

By visiting the branch Farms and Stations throughout Canada, the Dominion Animal Husbandman has been brought closely in touch with their work. Under the supervision of the director considerable assistance to the superintendents has been given in the laying out of new lines of live stock experimental work and in better conducting and systematizing such work as has been in progress for some time. A large number of sketch plans of buildings proposed for the branch Farms have been made and, approved by the director, have been placed in the hands of the Public Works for completion. By this means of co-operation, building work on the branch Farms will be facilitated and buildings will be constructed which are more economical and better adapted both for the purpose which they are intended and as an example for visiting farmers. Already such buildings which have been constructed on the branch Farms have shown a marked beneficial influence in the neighbourhood and province which each Farm represents. Many features of these buildings are being copied, in their essentials at least, by a large number of both the small and extensive live stock breeders.

MISCELLANEOUS.

A large number of blue prints and photographs of modern farm buildings have been distributed to farmers contemplating the erection of new farm buildings. Brief specifications have also been distributed for many of these.

The regular correspondence along the lines of maintenance of live stock, feeds and feeding, methods of breeding, and the like, has largely increased during the past year, showing the greater confidence which the farmers have in the work of this division, and the greater interest which they are taking in this work.

The members of the staff of this division have judged at many of the agricultural fairs throughout Eastern Canada, and have addressed a large number of meetings, throughout the year, on live stock subjects, as well as assisting in the campaign for "Patriotism and Production."

POULTRY DIVISION.

GENERAL EXPANSION.

Since the reorganization of the Poultry Division two years ago, the work has been gradually increasing, and the demand for still greater expansion is more and more apparent. For, though so much has been done to encourage the producer, Canada, according to the customs returns, even yet does not produce sufficient eggs to feed herself.

This division aims to help the farmer who keeps a small flock of hens, as well as the man who depends upon his flock for a livelihood, and with this end in view many of the problems that face the producer are receiving attention, and as the laboratory equipment at Ottawa is increased, research in more of these will be instituted. Among the questions that are receiving immediate attention are: Better housing; cheaper feeds; healthier stock; more suitable varieties; decrease of mortality; incubator problems; better and stronger fertility; higher average egg-yield; larger eggs; better preparation for market; best methods of shipping eggs for hatching, day old chicks,

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and breeding stock; the production of early winter eggs; a more even distribution of what the producer has to sell; the practicability of water fowl on the farm; the prevention or cure of blackhead in turkeys, as well as a number of other common diseases to which poultry of all kinds are subject.

Eleven of the branch Farms and Experimental Stations this year are equipped for work in poultry, where practical demonstrations are being conducted. At the Central plant the stock has been more than doubled during the past year, and a good beginning has been made with turkeys, geese, and ducks.

UNUSUAL CONDITIONS.

The past year has been remarkable in that prices for feed have been unusually high, while those received for the produce have not averaged quite as high as usual. Though the war may not have been entirely responsible for these conditions, there is no doubt that it intensified them, bringing up the price of feed and causing the prices paid for the produce to fluctuate considerably. In many cases producers complained that the cost of production was considerably more than the prices received for the produce, and though this may be true, there is no doubt that an experience of this kind should help the industry, in that producers will study how to produce more cheaply and how to market at the right season and without the usual waste that accompanies this system in Canada.

BUILDINGS.

The three small buildings erected at the Central plant a year ago have proved very helpful in the work. The experimental breeding house has made it possible to carry on some special mating experiments. The cockerel house has served for the purpose for which it was originally intended during the winter months, and has proved to be a satisfactory brooder house for chicks in the spring and summer; the feed and storehouse has rendered this end of the work more convenient, and the basement is being utilized as an incubator cellar.

The new administration building which was expected during the year has not yet been built and, because of this, the old buildings are still retained, but it is hoped that this building will be available very soon, when laboratory space will be procured, and more investigational work taken up.

THE WATER-FOWL PLANT.

Upon the area of land and water which was inclosed last year for a duck plant a small cottage for the attendant has been erected, and during the year this plant was utilized for the water-fowl. This spring breeding turkeys also were placed there. This makes an ideal spot, especially for the water-fowl, as considerable water is included inside the fence. Small yards reaching to an artificial pond have been constructed for the use of the breeding stock early in the spring before the water comes into the canal.

This addition to the Central poultry plant provides a much-needed range and makes it possible to carry on work that has been in contemplation for some time. It also adds to the general appearance by turning a wild land into a water-fowl park.

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THE EQUIPMENT AT THE BRANCH FARMS.

The poultry plant at each of the branch Farms and Experimental Stations is more for the purpose of demonstration than experimentation, and therefore comprises what might be considered ideal conditions for a farm poultry plant that is run on a commercial basis. Some of these Farms have their complete equipment, which includes houses of various types and sizes sufficient in all to accommodate between three and four hundred laying hens; incubator and brooder equipment to reproduce from one-half to two-thirds of the flock each year; an administration building, the basement of which is used for an incubator cellar, the first floor for office, bed-room and feed-room, the attic for storeroom.

This is called a one-man poultry plant, in that the work done on the plant is accomplished by one man, who also has time to carry out some experimental work and is prepared at any time to show visitors through the plant.

STOCK.

The stock includes ordinary fowl (hens), turkeys, geese, and ducks. The varieties, as a rule, are those which are considered to be more or less of a general-purpose character and suitable chiefly for farm conditions. All the branch Farms that have poultry plants keep hens, though only those specially situated have turkeys or water-fowl.

Seventy-five per cent of the hens on the branch Farms belong to the general-purpose breeds, such as Rocks, Wyandottes, etc. The remaining 25 per cent are White Leghorns, the most of which are at Agassiz, B.C., and Lethbridge, Alta., where the climate is better adapted to tender varieties, but even here it is found that the general-purpose breeds are giving better satisfaction, and as a consequence the proportion of lighter breeds will be diminished.

At the Central Plant.—During the past year the stock at the Central Experimental Farm has been materially increased. On January the first, 1915, there were 849 birds, 146 of which were water-fowl, turkeys, and guineas. Of the fowl, the Barred Rocks predominated, with White Leghorns second. These were followed by several pens of White Rocks and White Wyandottes, and smaller lots of White, Buff, and Black Orpingtons, Black and Brown Leghorns, and Black Minorcas, besides single matings of several other varieties. In ducks there were several matings of Indian Runners, Pekins, and Cayugas, and a pen each of Aylesburys and Rouens. In geese, Toulouse, Embden, African, and Wild were represented; and the variety of turkeys was Bronze.

At each Branch Farm.—About 300 laying hens are kept at each of the branch Farms. As a rule 200 of these are pullets and 100 year-old hens. The pullets are tested the first year by the trap-nest, and are fed for egg production, and 100 of the best of these are kept until the following year, when from them eggs are taken in the breeding season for hatching purposes.

With this arrangement it is necessary to mature 200 selected pullets each year; this means that at least five or six hundred chicks are raised to maturity. About 50 per cent are cockerels, the best of which are retained for selling as breeders to the farmers. Of the 300 pullets, 200 are selected for the laying pens.

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From one to four varieties are bred at the branch Farms, though it is not the intention to keep too many varieties, but rather to eliminate those which are the least satisfactory, and confine attentions to the one or two which prove most practical for the locality.

The hens, that is those birds that have passed through their second laying season, are sold immediately after the breeding season, usually in June. The selling of these hens at this time gives more room on the plant for the growing chicks; it also puts on to the market poultry flesh when it is comparatively scarce and consequently high in price, and indirectly it assists the market later on in the summer and fall when, as a rule, poultry meat of all kinds is marketed.

EXPERIMENTS.

The nature of the experiments conducted have already been referred to. There is not yet sufficient equipment to carry on considerable investigational work that is desirable, and attention is being paid especially to experiments of a practical nature which directly affect the producer. Some of these are reported on from year to year, others will take several years before there will be sufficient reliable data upon which to report.

One of the main experiments is the development of strains that will produce more eggs during the year and a larger proportion of eggs when eggs are dear.

This experiment, however, can be conducted only with a few varieties, as the detail which is necessary makes it impossible to spread the efforts over much ground. When it is taken into consideration that in this work it is necessary to keep track of every egg which each hen lays, to know how many of these eggs are fertile during the breeding season, at what stage the germ dies if it fails to hatch, how many hatch, followed by an accurate record of each chick, not only through its own life but through future generations, the detail of the work may be appreciated.

Because of the tremendous amount of detail in connection with this one experiment, efforts are being confined to two or three of the most popular varieties, and this year a number of cockerels from the best layers at the Central Farm were sent to the branch Farms. This system will be carried out from year to year, until all the male birds used at the branch Farms are supplied from the Central Farm, and are the product of the best laying strains.

In housing experiments it is interesting to note that the one type of house which has given such good results at Ottawa for years is really the house that can be recommended for practically every province in the Dominion.

BULLETINS.

During the year eight Exhibition Circulars have been published. No. 1 "Natural Incubation," by F. C. Elford, treats of the relative advantage of natural and artificial incubation, the need of system, how to set the hen, how to make the nest, how to keep things clean and free from mites. No. 2 "Artificial Incubation," by F. C. Elford.

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This explains how to tell a good machine, the size to buy, where to place the incubator, how to operate it, why good breeding stock is necessary, and a number of things worth remembering. No. 6, "The Farmer's Poultry House," by F. C. Elford; this gives plans of a suitable colony house for twenty or twenty-five hens, and for a stationary house to hold 100 hens, divided into two pens. Besides this it gives some general instruction on building the permanent and movable houses, how to keep things clean, how to ventilate, what floor space is required, best building material, etc. No. 12, "The Farm Flock," by George Robertson, describes what an ideal farm flock should be, who should manage the flock, the kind to keep, how to get a start, proper feeding and marketing. No. 13, "Brooding and Rearing of Chicks," by George Robertson; this treats of both natural and artificial brooding, and gives plans for small brood coops, feed hoppers, etc. It gives pointers on both methods, and definite but concise information on how to feed young chicks to get the best results. No. 29, "Duck Raising," by Victor Fortier. This gives general information in reference to the rearing of ducks, points out the advantages of duck raising, the best breeds, the laying and incubation, the care of the ducklings, and especially the feed, how to fatten for markets, and a few notes in connection with duck diseases. No. 30, "Management of Turkeys," by Victor Fortier, treats in a concise form on turkeys in general, with pointers on the breeding birds, the laying and the incubation, the rearing, feeding, parasites, etc. No. 31, "The Management of Geese," by Victor Fortier, gives a cut of a suitable goose house, mentions the most popular breeds, the care and feeding of the breeding stock, eggs and incubation, rearing fattening, how to distinguish the sexes and a few hints on diseases.

These circulars have also been revised and in addition, there have been prepared two circulars of the same series, by F. A. Elford, one, "The use of Trap-Nests," the other, "Wild Buckwheat for feeding poultry and crate feeding." These though not yet received from the Printing Bureau, will be ready within a few days.

Other bulletins which are in process of preparation are "Caponizing," "Rabbits," and "Pigeons," by Victor Fortier, and "Poultry Diseases," "Poultry Feeds and Feeding," by George Robertson. These will be ready for publication in the near future.

MEETINGS.

During the year the demand for speaking at meetings had been if anything greater than usual. Mr. Fortier has been absent 111 days during the year, and has lectured at sixty-one different places and judged at eighteen shows throughout Quebec and Ontario, and the fact that he did not get to more meetings was because of his inability to leave the office. Mr. Elford attended a number of meetings, but his work here and in connection with the branch Farms have made it impossible to attend very many of these meetings. He made two visits to the branch Farms and Experimental Stations inspecting the poultry work, and a number of "Patriotic and Production" meetings were attended by him during the campaign.

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CORRESPONDENCE.

The correspondence of the division is still very heavy. Information in circular form assists considerably, but the number of questions that have to be answered individually seems to be growing. So many people apparently are taking an interest in poultry work and they want a reply to their own letters dealing with their own individual case, and in so many instances the reply must be carefully prepared.

VISITORS.

The visitors to this division are increasing every year and require considerable attention from members of the staff. They are at all times received cordially, and the very best of attention is given to them. The majority of the visitors apparently do not come because of curiosity but from an earnest desire to gain information on poultry subjects.

The arrangement of the plant at present and the old buildings make it very inconvenient for proper inspection by visitors. The plans, however, for the new arrangement which can be put into execution when the administration building is built, are prepared, and when completed visitors will be able to go through the plant and see every detail with little inconvenience.

BEE DIVISION.

At the separation of the Division of Entomology from the Experimental Farms Branch, April 1, 1914, Mr. F. W. L. Sladen, former Assistant Entomologist for Apiculture, was left in charge of the apicultural work of the Dominion Experimental Farms, and became the apiarist.

At the Central Experimental Farm the experiment of wintering bees out-of-doors in cases packed with shavings, four hives to the case, having proved fairly successful in 1912-13, was continued in the winter of 1913-14 and 1914-15 in a portion of the apiary protected from wind by a high board fence, with the result in both winters that the bees wintered out-of-doors were, on the average, stronger in the spring than those wintered in the bee-cellar under the Farm foreman's house.

The appointment of Geo. F. Kingsmill, B.S.A., as assistant to the apiarist for a term of six months from June 29 to December '29 gave an impetus to the work of the division. It enabled the apiarist to make a tour of the principal branch Experimental Farms, and inspect the apiaries there, to study the conditions for bee-keeping in the regions served by these Farms, and to visit prominent bee-keepers. The western Farms were visited between July 27 and August 11. Bees were found on thirteen of the branch Farms, as follows: Brandon, Man., thirty colonies; Indian Head, Sask., one colony; Lethbridge, Alta., two colonies; Invermere, B.C., three colonies; Sidney, B.C., fourteen colonies; Agassiz, B.C., nine colonies; Lacombe, Alta., three colonies; Cap Rouge, Que., twenty colonies; Ste. Anne de la Pocatière, Que., fifty-one colonies; Nappan, N.S., eight colonies; Kentville, N.S., eight colonies; Charlottetown, P.E.I., nine colonies; and Fredericton, N.B., seven colonies. At Sidney, B.C., Agassiz, B.C., Kentville, N.S., Charlottetown, P.E.I., Fredericton, N.B., Cap Rouge, Que., and Ste. Anne de la Pocatière, Que., the bees were storing or had stored considerable quan-

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tities of honey, principally from clover. At Nappan, N.S., usually a good place for honey, adverse weather conditions for ingathering following severe winter-killing of alsike and white clover had prevented a crop, and had reduced some of the colonies to the verge of starvation. There was plenty of evidence that bees could be kept, in most cases with good profit, at all the branch Farms and Stations visited.

Undoubtedly the chief hindrance to greater profit in the apiaries on the branch Farms is excessive swarming. At most of the Farms the possible honey yield had evidently been cut in half or less by swarming. At Agassiz, unusually strong measures had been taken to prevent swarming, but without success, several swarms having been lost.

Attempts begun by the apiarist in 1913 to breed bees by selection for the improvement or fixation of desirable characters were pushed a stage further in 1914. A bee-mating station that he had chosen on the Kazubazua Plains, Quebec, about 40 miles north of Ottawa, was again employed, and a number of queens bred from a non-swarming colony of Italians found in the apiary at the Central Experimental Farm were mated there in September and October with drones from the same colony. These bee-breeding experiments are to be continued in 1915, and it is hoped by their means to discover whether it is practicable to breed Italian bees by selection, and if so whether the disinclination to swarm, noticeable in certain colonies, is inherited. Should it be found that this character is inherited it is hoped that it may be possible to produce a variety of bee that swarms but little, so that bee-keepers may be saved the great amount of labour and loss incidental to swarming.

An attempt to investigate and improve by selective breeding the quality possessed by Italian bees, some more than others, of resistance to European foul brood, a very destructive, persistent and rapidly-spreading disease of bees, is also being made.

The bees at the Central Experimental Farm are being transferred from the old hives of various sizes and patterns to new 10-frame Longstroth hives of uniform type, thus enabling comparative tests of colonies to be better and more easily made than formerly.

TOBACCO DIVISION.

The season of 1914-15 was very unfavourable for tobacco plantations, in Quebec as well as in Ontario.

The spring of 1914 was exceptionally warm, but the mean temperature of the summer was continually below the average, and the nights were always cool. Furthermore, the beginning of the month of June was characterized by a drought such as has very seldom been experienced. The fields of tobacco had great difficulty in taking root, and in many cases the farmers were compelled to reduce the area in tobacco.

This year, as in the past, the experimental field of the Central Experimental Farm was used for seed production and tests of varieties. A special selection was made of smoking tobaccos generally used in Canada. Among the newly tried varieties, the "Maryland" and "Feuille d'Or" gave particularly good results.

The tobacco crop at the Station of St. Jacques l'Achigan, Que., was particularly affected by the unfavourable climatic conditions. The yields in weight were poor, the

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plants gave a short leaf and a little too thick. However, it was possible to make a number of selections in the varieties Yamaska and Big Ohio Sumatra. The seeds ripened well and the best types will be tried in 1915.

The Station of Farnham, Que., is being rapidly improved. The drained area has been increased by about 10 acres. A kiln has been built for the purpose of experimenting, under Quebec conditions, with the flue-curing process, as used in Virginia and Carolina. The results obtained in 1915 cannot be said to be satisfactory, but it is hoped that they will be improved, when operating under better conditions and with varieties of tobacco grown on the Station and better adapted to this method of drying. The tobacco treated in 1914 had been produced in the neighbourhood of the Station.

In spite of the difficulties met with at the beginning of the season, the crop of the Farnham Station had a very good appearance, when it was damaged, on the 19th August by a hail storm which greatly lowered the quality of the products, particularly of those which were to be used as binders. This is all the more unfortunate because it prevented us from recording reliable data as to the relative value of the new binder types grown at the Station.

The Station of Harrow, Ont., gave almost a normal crop of Burley. As to the Virginian tobacco, which is treated by the flue-curing process, the proportion of really yellow leaves was not as large as during the last few years. It seems to be very difficult to secure bright yellow tobacco on the land of the Station when the season is not particularly favourable.

An interesting programme of experiments of a semi-technical and semi-practical nature, covering all phases of the growing of tobacco, is now in progress at the Stations of Farnham and Harrow. Interesting results have been obtained at the end of the first season, especially as regards the chemical fertilizers.

Harvesting and curing methods have been improved with a view to lower the cost, to secure cleaner products and reduce the period of curing. Appreciable results have been obtained.

At the beginning of the season, two inspectors were added to the Tobacco Division, one for Ontario and one for Quebec. The first came from Kentucky, and the other from France, where he was attached to the staff of the Tobacco Administration. These inspectors have enabled the Tobacco Division to get into closer touch with the growing centres already established, and to ascertain the possibilities in new centres.

Over 4,000 samples of tobacco seed were distributed during the winter. There seems to be a tendency in Quebec, especially in the North Shore districts, to substitute the growing of smoking tobacco to the growing of binder tobacco. This movement is increasing from year to year.

EXPERIMENTAL STATION, CHARLOTTETOWN, P.E.I.

The season of 1914 was a favourable one in Prince Edward Island, the crops equalling those of the banner year of 1910. Grain was late in maturing, but ripened well, and the harvesting weather of September was excellent.

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In addition to the work in horticulture and with field crops, experimental feeding of steers and lambs was successfully carried on. Two poultry houses were put up during the year.

EXPERIMENTAL STATION, FREDERICTON, N.B.

The winter of 1913-14 was a very cold one, and the spring backward, the weather being cool until the end of July. Growth was consequently slow until August, but warm weather during that month and in September resulted in good crops being harvested in excellent condition.

During the year, the dairy barn, dairy, and horse stable were completed, some poultry buildings were put up, and a double cottage erected. A small area was purchased to round out the Station holdings. Some experimental work was carried on, especially in testing fertilizers with potatoes, but most of the field work was of a preparatory nature, consisting of clearing, breaking, draining, and fencing.

A dairy herd has been placed at this Station, and some experimental feeding of beef cattle carried on.

EXPERIMENTAL FARM, NAPPAN, N.S.

In spite of a somewhat backward spring, the season of 1914 was productive of good crops of grain, forage, and roots, harvested in good condition.

The Farm buildings were wired for electric lighting during the past winter.

Experimental work in all the various lines was carried on, as in previous years.

EXPERIMENTAL STATION, KENTVILLE, N.S.

Work with cereals, horticulture, forage crops, animal husbandry, poultry raising, and bee-keeping was carried on at this comparatively new Station, and further clearing and breaking was done. The demonstration orchard work was continued in the Annapolis valley, and valuable results obtained.

Work on the land commenced on May 16. The season was, on the whole, favourable to all field crops.

EXPERIMENTAL STATION, STE. ANNE DE LA POCATIÈRE.

A pure-bred and a grade herd of dairy cattle were placed at this Station. Fruit plantations were sent out and considerable experimental work done. Most of the season, however, was devoted to draining, fencing, and stoning the fields. The farm buildings erected have proven satisfactory. An apiary has been established, and good returns obtained.

Seeding commenced on May 9, and growth was good until the latter part of June, when a drought commenced which lasted throughout July and the greater part of August. As a result, yields were much below the average.

EXPERIMENTAL STATION, CAP ROUGE, QUE.

The season at this Station was marked by scanty precipitation up to the middle of August, which lessened crop yields, but abundant rains later made the harvest a

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fair one. Experimental work in all lines was carried on. A large amount of draining was done. The road in front of the Station was macadamized and a water system put in. A poultry administration building was put up.

EXPERIMENTAL STATION, LENNOXVILLE, QUE.

The work at this new Station was preparatory in nature. A large amount of fencing and draining was accomplished, and some repairs made to the old buildings already on the property when purchased, to fit them for temporary use. No new buildings were erected here during the year.

A feeding experiment with steers and another one with lambs have been carried on with satisfactory results.

EXPERIMENTAL FARM, BRANDON, MAN.

Seeding was somewhat later than usual, owing to a backward spring, but warm weather and abundant moisture caused excellent growth up to the beginning of July. Thereafter, the weather was hot and dry, with high winds. Grain crops ripened too rapidly, and the yield was lessened from one-fourth to one-third.

Work was carried on in all branches of agriculture, horticulture, and live stock raising, and dairying.

EXPERIMENTAL STATION, MORDEN, MAN.

An area for an Experimental Station at this point in southern Manitoba was purchased just at the close of the fiscal year. It is the intention to make horticulture a main feature of the work at that point.

EXPERIMENTAL FARM, INDIAN HEAD, SASK.

Extreme heat and drought caused a premature ripening of cereal crops, and wheat was damaged by frost on August 9. The yield of wheat was fairly good, however, considering the dry weather. Oats, barley, potatoes, corn, and roots were a light crop.

Extensive feeding tests with steers and lambs were carried on.

EXPERIMENTAL STATION, ROSTHERN, SASK.

Spring opened later than usual, seeding beginning on April 23. Growth was good until early in July, when a prolonged drought lowered yields of all grain crops. An additional area was purchased at this Station which will permit of a considerable extension of the work carried on. A cottage for the foreman was built during the summer.

EXPERIMENTAL STATION, SCOTT, SASK.

Seeding commenced on April 15. The season was the driest recorded in the district. What rain fell came in light showers, which were soon dried up by the hot winds. These conditions seriously reduced yields of all field crops.

During the year a half-section of land was added to the Station, making its present area 518½ acres, and considerable fencing was done on this new area. A cottage for the foreman was built.

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EXPERIMENTAL STATION, LETHBRIDGE, ALTA.

The drought of 1914, taking area affected and intensity into consideration, was the most severe since the settlement of southern Alberta. The soil was fairly moist when seeding commenced, but the rainfall during April, May, and early June was extremely light. July was so dry and hot that the failure of grain crops was general, with the exception of those on summer-fallow.

Alfalfa on irrigated land gave heavy yields, and irrigated grain crops did fairly well. Some damage was done by cutworms.

Feeding experiments with steers and lambs were carried on successfully.

EXPERIMENTAL STATION, LACOMBE, ALTA.

Seeding commenced on April 13, under favourable conditions. May was a dry month, but abundant rains in June and a warm July made growth rapid, and an excellent harvest was obtained.

An office building was erected, some improvements made to other buildings, and considerable fencing done.

Work with dairy cattle, beef cattle, swine, and poultry was continued during the year, with excellent results.

EXPERIMENTAL STATION, SUMMERLAND, B.C.

This Station was established in the autumn of 1914, and is an area purchased from the Indians of the Penticton reserve. A large amount of work has been done during the winter and early spring in clearing and levelling, ready for irrigation, and all preparations have been made for laying a pipeline from Trout creek to the Station lands, for this purpose.

EXPERIMENTAL FARM, AGASSIZ, B.C.

Seeding commenced on April 18. The season on the whole was a very dry one. From June 27 until harvest there was practically no rain. Fairly good crops were obtained, however.

Extensive experimental work was carried on with the dairy herds and in dairying, also in swine feeding. Work with poultry is a feature at this Farm. A considerable area was cleared for crop, a herdsman's cottage was built, and a small addition made to the dairy building to provide a cheesemaking room.

EXPERIMENTAL STATION, INVERMERE, B.C.

The work here was mainly preparatory, although considerable experimental work in horticulture was also accomplished.

The Station land was cultivated and levelled, ready for laying out rotations and carrying on tests in irrigation and dry-farming. Fruit and ornamental trees were set out, and a beginning made with poultry work. Two poultry houses were built, also a root cellar with incubator room above, and an implement shed.

EXPERIMENTAL STATION, SIDNEY, B.C.

The work at this new Station consisted mainly in the continuation of operations in clearing, draining, grading, ploughing, setting out orchards and plantations, fencing,

etc. No farm buildings have yet been erected at this Station. General farm work has been possible during most of the winter.

SUBSTATIONS.

A limited amount of experimental work was carried on at Forts Vermilion, Smith, Resolution, and Providence, Grouard and Grande Prairie, in Alberta. At Salmon Arm, B.C., Mr. Thos. A. Sharpe continued his work in horticulture, for the department.

At Fort Vermilion, the most important of the Alberta substations, the results were, as usual, excellent in practically all crops grown.

FIELD CROPS OF THE DOMINION.

The growing season of 1914 was marked by prolonged periods of drought in most sections of the Dominion with the exception of the Maritime Provinces, where growing conditions were favourable, and crops good. The drought came at a time to be especially unfavourable to the growth of grain, the average yields per acre throughout Canada being considerably below those of 1913.

Potatoes gave higher yields this year, as did also turnips, fodder corn, and sugar beets. Hay, clover, and alfalfa gave somewhat lower average returns in 1914.

The following tables, compiled from the Census and Statistics Monthly, give the estimated areas, yields, and values of the principal field crops of Canada for the years 1913 and 1914.

AREAS and Estimates of Yield and Value of Field Crops, 1914.

Crop.	Area.	Yield per acre.	Total Yield.	Weight per bushel.	Average price.	Total value.
	Acres.	Bush.	Bush.	Lb.	\$ cts.	\$
Fall wheat.....	973,300	21·41	20,837,000	59·61	1·05	21,818,000
Spring ".....	9,320,600	15·07	140,443,000	59·16	1·24	174,600,000
All ".....	10,293,900	15·67	161,280,000	59·49	1·22	196,418,000
Oats.....	10,061,500	31·12	313,078,000	36·31	0·48	151,811,000
Barley.....	1,495,600	24·21	36,201,000	47·22	0·60	21,557,000
Rye.....	111,280	18·12	2,016,800	55·47	0·83	1,679,300
Peas.....	205,550	17·64	3,362,500	60·53	1·46	4,895,000
Buckwheat.....	354,400	24·34	8,626,000	48·20	0·72	6,213,000
Mixed grains.....	463,300	35·36	16,382,500	45·51	.. ..	10,759,400
Flax.....	1,084,000	6·62	7,175,200	52·49	.. ..	7,468,000
Beans.....	43,830	18·20	797,500	60·21	.. ..	1,844,300
Corn for husking.....	256,000	54·39	13,924,000	56·62	.. ..	9,808,000
Potatoes.....	475,900	180·02	85,672,000	.. ..	.. ..	41,598,000
Turnips, etc.....	175,000	394·30	69,003,000	.. ..	.. ..	18,934,000
		Tons.	Tons.			
Hay and clover.	7,997,000	1·28	10,259,000	.. ..	.. ..	145,999,000
Fodder corn.....	317,000	10·25	3,251,480	15,949,700
Sugar beets.. ..	12,100	8·98	108,600	651,000
Alfalfa... ..	90,315	2·42	218,360	3,095,600

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LIVE STOCK IN THE DOMINION.

The following table gives the numbers of the principal classes of live stock in the Dominion for the years 1910-14, inclusive.

Live Stock.	1910.	1911.	1912.	1913.	1914.
	No.	No.	No.	No.	No.
Canada—					
Horses	2,213,199	2,595,912	2,692,357	2,866,008	2,947,738
Milch cows.....	2,853,957	2,594,179	2,604,488	2,740,434	2,673,286
Other cattle.....	4,250,963	3,939,257	3,827,373	3,915,687	3,363,531
Sheep	2,598,470	2,175,302	2,082,381	2,128,531	2,058,045
Swine	2,753,964	3,610,428	3,477,310	3,448,326	3,434,261

HEALTH OF ANIMALS BRANCH.

During the past year, the officers of this branch have been engaged in the task of securing control over and eradicating the various diseases enumerated in the Animal Contagious Diseases Act. To ensure against the introduction of infection from outside sources, a systematic and thorough inspection of all import animals was made; and to prevent the spread of any disease inside our borders, the cleansing and disinfection of live-stock cars and yards was carried out under the supervision of inspectors of the Health of Animals Branch.

Immediately following the discovery of foot-and-mouth disease in the United States, it was necessary to prohibit absolutely the importation therefrom of all domestic animals, their parts and products, as well as all materials that might in any way, by contact, have brought the malady into Canada. The importance, however, of securing horses for the British army made a modification of the restrictions imperative, and, consequently, horses obtained by the British Remount Commission were allowed entry under certain definite conditions. Recently, also, it was deemed advisable to allow the entry of a limited number of horses upon the importer obtaining a permit from the Veterinary Director General.

Foot-and-mouth disease, also, precluded the issuance of permits for the importation of ruminants and swine from the British Isles during the greater part of the year. The British Board of Agriculture, however, succeeded in stamping out the disease, and the department is now in a position to consider favourably the issuing of permits for the importation of cattle, sheep, and swine from any part of Great Britain.

Glanders was well under control during the year, the unceasing vigilance of the veterinary inspectors preventing the spread of the disease over more than very limited areas. The success that is being met with in dealing with this disease will be readily appreciated when last year's figures are compared with those of former years. The number of 638 horses slaughtered for glanders in 1912-13 was reduced to 353 in 1913-14, and further reduced to 340 in the last fiscal year. To guard against the re-introduction

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of infection from other countries, all import horses must be tested either before being shipped, or upon arrival at the boundary.

Dourine, or *maladie du coit*, is still causing considerable anxiety in Alberta and Saskatchewan. A small outbreak in the province of Quebec was promptly checked. During the year, 390 horses were slaughtered, as compared with 471 the previous year. The improved method of diagnosis by means of a serum test enables Dr. A. Watson, of the Veterinary Research Laboratory at Lethbridge, to definitely determine the presence of this disease in the infected animals, even though they may show no symptoms.

Mange in cattle and horses is being given the most careful attention, especially in Alberta, where a force of range riders is employed to search for infected animals on the open range. In all parts of the Dominion the figures for the year show a marked decrease, the total number of horses found infected being 190, as compared with 300 in 1913-14; 450 horses were quarantined during the year, as against 1,638 the previous year. The efforts to eradicate cattle mange are likewise achieving noteworthy results—1,660 cattle being found diseased out of a total of 30,300 quarantined, a large decrease from the figures of the previous year, when 2,724 animals were found suffering from mange, out of a total of 62,149 quarantined. The disease having been completely eliminated from a large portion of the territory under quarantine restrictions, it was possible to lessen considerably the quarantined area.

Sheep scab.—The strictest precautions are taken to guard against the introduction of this disease into Canada—a thirty-day's quarantine being imposed upon all import sheep except those imported for immediate slaughter. In the province of Manitoba, where 270 diseased sheep were found, occurred the only outbreak during the year.

Hog cholera has been more prevalent during the past year than for several years preceding. On account of the large sums of money involved in compensation, a change was recently made in the regulations, whereby it is hoped to save a certain amount of exposed hogs, which have hitherto been a dead loss; these hogs may now be immunized by the serum method, with a view to converting them into pork. This treatment will be at the hands of veterinary inspectors only, who are so authorized by the Veterinary Director General. During the year about 34,500 hogs were slaughtered—more than 24,500 in excess of the number slaughtered during the year 1913-14.

Rabies was confined to Ontario, British Columbia, and Saskatchewan. In all, 305 animals were quarantined, of which 122 were dogs. Only in the Cowichan district in British Columbia it was necessary to issue a general muzzling order, and this order is still enforced. It is hoped that the energetic measures taken will have the effect of stamping out the trouble at an early date.

Tuberculosis in cattle being transmissible to human beings, it was deemed advisable and in the public interest for the Government to assist those cities and towns endeavouring to ensure a pure and wholesome milk supply for their inhabitants. For this purpose, in June, 1914, a new set of tuberculosis regulations was drafted, whereby the Department of Agriculture, under certain conditions, might give its aid in the

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control of bovine tuberculosis in municipal dairy herds. As in former years, the department has dealt with the testing of import and export cattle for breeding purposes, the testing of the cattle in supervised herds, and those exported for breeding purposes to British Columbia. Tuberculin has also been supplied, free of charge, to private practitioners, on condition that they report the results of the test; 3,784 tests were applied by officers of this branch, as compared with 5,050 the previous year, the percentage of reaction being $5\frac{2}{3}$ as against 8 per cent in the year 1913-14; 3,250 tests were applied by private practitioners, as compared with 4,750 the previous year, the percentage of reaction being, respectively, 13 and 7 per cent.

Anthrax caused very little trouble throughout the year, although outbreaks in old infected districts of Quebec and Ontario are causing considerable alarm. In Quebec, 470 animals were quarantined, while in Ontario three animals were found diseased out of a total of 185 quarantined.

The system of fox inspection inaugurated during 1913 was carried on during the past year, two fox farms being quarantined for scabies.

Dr. S. Hadwen, the Pathologist at Agassiz, B.C., is carrying on his experimental work in connection with red water, while Dr. A. Watson, at Lethbridge, is engaged in the testing of blood samples from suspected dourine cases.

The pathologists engaged at the Biological Laboratory at Ottawa have carried on their usual work in connection with the reports on specimens, the preparation of vaccines, and experimental work in connection with blackhead in turkeys, strangles, and contagious abortion. During the year it was also necessary to furnish the Militia Department with vaccines. Dr. T. C. Evans succeeded in preparing a vaccine which gives excellent results in the treatment of strangles. This vaccine is now on sale to veterinarians at a cost of $2\frac{1}{2}$ cents per dose.

The demand for blackleg vaccine during the past year has been unprecedented in the history of the branch, while the absence of outbreaks of anthrax has fortunately limited the applications for anthrax vaccine. These vaccines sold at a cost of 5 cents a dose.

The buildings at the new animal quarantine station at Lévis, Que., were recently completed, and are now ready to accommodate oversea importations.

MEAT AND CANNED FOODS DIVISION.

The work carried on by this division shows a greater increase than in any year since its inception.

The records of slaughter indicate that there have been killed, in inspected establishments, 533,425 cattle, 2,598,738 hogs, and 447,173 sheep, an increase over the previous year of 748,998 animals.

In order to properly carry out the regulations, a number of new appointments were necessary, yet with these additions to the staff, inspectors have been called upon to perform an unusual amount of work, which demand has been met with commendable willingness.

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Owing to the war a very large number of our officers volunteered for active service and, after careful consideration, as many as possible were allowed to go to the front. In order, however, that the work of inspection might be properly supervised and that the freedom from disease and wholesomeness of the somewhat extraordinary shipments of meat and meat food products which were being sent abroad for the use of our troops and foreign customers might be guaranteed, it was essential that the staff should not be further reduced, and in consequence of this it became necessary to refuse later applications for leave. This spirit of loyalty in our inspectors is very much appreciated, but the impossibility of granting all applications for military leave will be at once understood when it is considered that the principal appointees to this service must be graduate veterinarians who have by examination shown that they possess special qualifications for the work.

As a result of the increase in hog production, additional establishments were brought under inspection. While these plants had been in operation for some time, their trade had hitherto been confined to the province in which they were situated, and it is encouraging to note their faith in the future development of the live-stock industry as evidenced by their desire for a greater market.

The increase in the number of hogs was due to the continued extra production in the western provinces.

The standard set by which veal carcasses are adjudged as to their fitness for food is producing splendid results. The class of such carcasses now being presented for inspection shows that they are being well fed and kept for a sufficient length of time to ensure their being a sound and wholesome food. The unwarranted practice previous to 1907 of placing on the market calves of questionable age is almost a thing of the past and has resulted in keeping on the farm for growth and development a large percentage of calves which will augment our future beef supply.

The slaughter of sheep and lambs shows a decrease. The demand for this nourishing and healthy meat food is on the increase, and is evidenced by the exceptionally high prices which have prevailed, and which have no doubt proven remunerative to the producer. It is hoped that there will be an extended development of this class of food animal.

Sanitary conditions in the inspected establishments have been well maintained. Additions and alterations are being continually made with a view to facilitating rapid operations with a maximum degree of cleanliness.

FRUIT AND VEGETABLES.

The past year was very favourable for the growth of fruit and vegetables, which resulted in a very large pack and a consequent reduction in the price to the consumer.

The pack of evaporated apples was somewhat smaller than usual, yet the quality could be said to be rather better than in previous years. This was due in some measure to the enforcement of the standards as to moisture content.

The sanitary conditions of these different plants were, on the whole, satisfactory.

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CONDENSED MILK.

The conditions to be found in the milk-condensing establishments are excellent. The pack during the past year was normal, and little difference prevailed in price.

FRUIT BRANCH.

Previous to May 1, 1914, the work of the Fruit Branch had been under the direction and supervision of the Dairy and Cold Storage Commissioner, as the Fruit Division of this branch. The growing importance of the fruit industry necessitated a change; on the date above mentioned the Fruit Branch was created.

The past year, so far as the Fruit Commissioner's own duties were concerned, has been largely one of organization. He has visited all the fruit-producing centres of Canada with which he was not entirely familiar, and has endeavoured to acquaint himself with existing conditions and with the needs of the fruit industry. The information thus obtained will enable the development of the branch to be made along lines which will best serve the interests of the industry.

THE FRUIT SEASON.

The most notable feature of the past season was the almost total failure of the peach crop in Ontario, due to winter injury to the buds in January and February, 1914. A good crop was harvested in British Columbia. Pears and plums were a light crop in Ontario, and a full crop at the Pacific coast. The Niagara grape and cherry crop was an exceptionally heavy one.

For apples, the season was not altogether favourable. Early in the year there was every indication of an excellent crop in all the fruit-producing sections of the country, and as the time for harvesting approached, reports continued to be optimistic. It was particularly noted that the fruit was above average in quality, a result largely brought about by more effective spraying. The outbreak of war in Europe almost completely demoralized the market for the time being. It was impossible for growers to secure space for the ocean transportation of early varieties, and there was no certainty of conditions being more satisfactory when the later varieties were ready for shipment. The result was that much of the crop of early apples went to waste. Growers who had been dependent upon the itinerant apple buyers found themselves confronted with the difficulty of marketing their own fruit, and in many cases were quite unable to meet the situation. Efforts were made to relieve these conditions. The Government gave much assistance by conducting an advertising campaign with the object of increasing home consumption. The sailings of transatlantic steamships became more regular after the departure of the first Canadian contingent. By the time the main bulk of the apple crop was harvested, the markets were more normal and the prices received on Old Country shipments were generally satisfactory. In certain sections of Ontario there was considerable waste, but the consensus of opinion is that the season was quite as favourable as could be expected under existing conditions.

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CROP AND MARKET REPORTING.

Careful attention was given to crop and market reporting. A special inquiry was made into the peach situation early in May, and a report issued at the time foretold the failure of that crop in Ontario. A monthly Fruit Crop Report was published in June, July, August, and September, compiled from the reports of many practical growers throughout the country. Later in the season, owing to the uncertain state of the fruit market, there was a demand on the part of the growers to be kept closely in touch with prices and with the general situation in the home and foreign markets. A system of telegraphic reporting was introduced. Cables were received at frequent intervals from the principal markets in Great Britain, and telegrams from all the important Canadian markets, as well as the large producing centres. During October, November, and December these telegraphic reports were condensed and published three times a week in the leading Canadian newspapers, and also sent to any individuals to whom they might be of special value. So successful was this system of reporting that the names of practically all the important growers and dealers were ultimately added to the mailing list. The work of reporting will be carried on along similar lines and on a more extensive scale next season.

FRUIT FOR THE PANAMA PACIFIC EXPOSITION.

During the fall of 1914, 2,000 boxes of Canadian apples were packed for the Panama Pacific Exposition at San Francisco. The exhibit was collected from all the fruit-producing provinces of the Dominion, specially packed and loaded in cars. It arrived at its destination in perfect condition and attracted much attention. These 2,000 boxes are sufficient to keep Canadian fruit on exhibition until the end of the summer, when a further collection will be made.

FOURTH DOMINION FRUIT CONFERENCE.

In spite of the war and the consequent difficulty of holding large representative gatherings, I was pleased to be able to arrange the Fourth Dominion Fruit Conference on September 2, 3, and 4. Forty-five regularly accredited delegates were present, including representatives from the Provincial Departments of Agriculture, the Provincial Fruit Growers' Associations, Agricultural Colleges, Apple Shippers, Associations, and wholesale fruit trade.

A complete report of the proceedings of the conference is now being published for general distribution.

INSPECTION WORK.

The administration of Part IX of the Inspection and Sale Act continues to be an important part of the Fruit Branch. The arrangement made at the beginning of the season 1912-13, whereby the country was divided, for fruit inspection purposes, into five districts, with a chief inspector in charge of each, has proved most satisfactory, and was continued during the past season. A staff of fifty-four men, including the chief inspectors, was employed in the inspection work during the season 1913-14.

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The system of inspection followed was the same as in former years, except that in Nova Scotia, where previously practically all the inspection was done at the port of Halifax, the Fruit Commissioner made a trial of inspection at point of shipment, which has been advocated by the growers for some time. Eleven out of the thirteen men employed in this province were stationed at the shipping stations throughout the Annapolis valley, where they were able to inspect the fruit as it was being packed and shipped. The experiment proved most satisfactory, and the fruit men generally throughout Nova Scotia expressed their desire that this system of inspection should be continued. The presence of the inspectors in the warehouses and packing sheds appeared to have a deterrent effect on false grading and packing, and only twelve convictions for violation of the law were recorded in Nova Scotia this season, as against thirty in 1913-14.

It is gratifying to be able to state that the convictions under Part IX of the Inspection and Sale Act were only seventy-eight for the whole Dominion during the past season, as compared with 105 in 1913-14. Of the seventy-eight, fifteen convictions were secured with respect to imported fruit which was not marked in accordance with our Canadian law. The decrease in the number of violations of the Act is no doubt partly due to the fact that the 1914 crop was large and of splendid quality generally, but credit must also be given to great improvement which is noticeable in the commercial pack.

APPLE PACKING DEMONSTRATIONS.

During the past winter, in addition to their other duties, the fruit inspectors gave instruction and demonstrations in the modern methods of packing fruit. In British Columbia this work was done in co-operation with the Provincial Department of Agriculture at their packing schools. In Ontario, Nova Scotia, New Brunswick, and Quebec, practical demonstrations were given in packing houses, extending in some cases over several days. These meetings have been very popular and have already resulted in much improvement, particularly in the apple pack of Eastern Canada.

ENTOMOLOGICAL BRANCH.

At the beginning of the year the Entomological service of the department was separated from the Experimental Farms Branch and organized as a separate branch under the direction of the Dominion Entomologist, Dr. C. Gordon Hewitt. The work of the branch comprises the administration of the insect and pests section of the Destructive Insect and Pest Act; the suppression of the Brown-tail Moth and the introduction of its parasitic and predaceous insect enemies, and those of the Gypsy-moth into New Brunswick and Nova Scotia; the carrying on of investigations upon insects affecting farm, garden, and orchard crops, forest and shade trees, live stock, household and public health, mills and stored products, and the answering of inquiries and the giving of advice concerning the control of such insects; the naming of collections of insects for institutions and individuals, and the administration of an appropriation of the Department of Indian Affairs for the care of the orchards on the Indian reservations in British Columbia.

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Under the Destructive Insect and Pest Act, nursery stock organization in countries in which the San José Scale occurs was fumigated at our various fumigation stations. The erection of the new station at Montrose (Niagara Falls, Ont.) for the fumigation and inspection of imported nursery stock was completed in time to permit its opening at the beginning of the year, and the first season's experience has amply demonstrated the value and economy of this addition to our plant quarantine system. Nearly five million imported trees and plants originating in Europe, Japan, and the New England States were inspected during the importation season of 1913-14 for Gypsy and Brown-tail Moth and other insect pests.

As a result of the enormous flight of the Brown-tail Moth from the New England States into the provinces of New Brunswick and Nova Scotia in July, 1913, the infested area in each of these provinces was materially increased, and the number of winter webs collected was many times greater than in previous years. The total infested area in the two provinces was found to be over 13,500 square miles, as compared with about 9,000 square miles in the previous year. I am pleased to acknowledge the continued co-operation of the Provincial Governments who employ half the number of men engaged under the direction of my officers in the collection of the winter webs of the Brown-tail Moth.

Through the continued courtesy and co-operation of the United States Department of Agriculture it has been possible to continue our work of collecting parasitized Gypsy and Brown-tail Moth caterpillars in Massachusetts, where they have been established, having originally been introduced from Europe and Asia, and to breed out the parasites at the Gypsy-moth Laboratory, Melrose Highlands, Mass. These parasites, and predaceous beetles that were also collected, were shipped to our entomological laboratories at Fredericton, N.B., Bridgetown, N.S., and Covey Hill, Que., the greater proportion being shipped to Fredericton for establishment at strategical points in New Brunswick. One species of parasite is now firmly established in Nova Scotia.

It has now been possible to realize the advantages of the policy of establishing field or regional laboratories in different regions of the Dominion for the study of serious insect pests. The presence of trained men to assist the agriculturists in regions where outbreaks of insect pests have occurred, has on several occasions been the means of preventing more serious losses, and the educational work my field officers are carrying on is proving to be a valuable form of assistance. Their close and constant contact with the farmers and fruit growers is proving to be of the greatest benefit. A new laboratory was established in Stanley Park, Vancouver, B.C., during the year, making the number of these laboratories nine. The following is a list of the entomological field laboratories, showing the investigations that are being carried on by my officers who are in charge:—

Bridgetown, N.S.—Investigations on the Brown-tail Moth, the introduction of its parasites and control work. The control of Bud Moth and Green Fruit-worms of apple.

Fredericton, N.B.—Control work and investigations on the Brown-tail Moth and the introduction and establishment of its parasitic and predaceous

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enemies; parasitic and natural control of native insects: the Tent Caterpillar, Fall Web-worm and Spruce Budworm.

Covey Hill, Que.—Apple insects, particularly Apple Curculio; control of locusts by bacterial disease.

Vineland Station, Ont.—Apple Maggot; aphids affecting apple; control of greenhouse, mill-infesting, and miscellaneous insects.

Strathroy, Ont.—Investigation of white grubs, wireworms and insects affecting field crops; Army-worm control.

Treesbank, Man.—Insects affecting cereal crops; Hessian Fly, Wheat-stem Saw-fly and Wheat-stem Maggot, and locusts; white grubs.

Lethbridge, Alta.—Cutworms and Nematodes ("eelworms") affecting cereal and other crops.

Agassiz, B.C.—Root Maggots; Wheat Midge; and insects affecting fruit, particularly the Bud-moth of Apple.

Vancouver, B.C.—Primarily the investigation of insects destroying coniferous trees in Stanley Park; Bark-beetles, and other forest insects.

Progress has been made in the fruit-insect investigations carried on at the different laboratories. In Nova Scotia, our experiments on the control of the Bud-moth have disclosed a spraying system that is now being demonstrated to the fruit growers. The discovery of the alternate host of the Apple Aphis by one of my officers is of importance.

During the summer of 1914, a severe outbreak of the Army-worm was experienced in Eastern Canada, particularly in Ontario, where the loss of the farmers was very great. A much greater loss was prevented by the prompt action of our local field officer and the representatives of the Provincial Department of Agriculture. A thorough study of the insect was made. Further work was carried on in regard to the control of locusts, both by bacterial disease and poisoned baits. The success that followed the experimental and demonstration work with the poisoned bran made according to the Kansas formula is very encouraging in view of the serious losses that have been caused by locusts in Eastern Canada during the last few years. The study of the Nematode worms, popularly known as "eelworms," affecting cereals has been continued in Alberta in the hope that it may throw some light on certain obscure troubles affecting wheat in that region. In the same region the investigation on the control of cutworms affecting cereals has been continued. Continued and satisfactory progress is being made in the White Grub investigation that is being carried out in Ontario and Manitoba. Experimental work on the control of root maggots has been continued at Ottawa, Ont., and at Agassiz, B.C.

The work on insects affecting forest and shade trees has been continued along the same lines as last year. Special attention has been paid to investigations of the injuries caused in our forests, particularly those in British Columbia, where a large amount of valuable merchantable timber is being destroyed by bark-beetles. The methods of control must be based upon a study of the life-histories and habits of the various species. The situation of the lumbering industry in British Columbia unfortunately prevented the undertaking of control measures that we had planned with a view to checking certain serious outbreaks of bark-beetles that are causing

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heavy losses. Owing to the widespread destruction caused by certain species of insects on spruce and hemlock in Stanley Park, Vancouver, B.C., an investigation was undertaken of the insects responsible for the damage. In the eastern provinces the most serious injuries have been caused by the Larch Saw-fly, the Spruce Budworm, the Forest Tent Caterpillar and certain Bark-beetles and larger Wood Borers. The first of these is continuing to spread westward, and has killed much timber. The outbreak of the Tent Caterpillars in Eastern Canada is now on the decline; a study of its natural control and that of the Spruce Budworm is being carried on.

During the year the Dominion Entomologist visited those sections in Eastern Canada in which investigations were being conducted, and has given addresses before agricultural and other meetings on the different aspects of insect control, in which educational work the other officers of the branch have taken an active share.

BRANCH OF THE CANADIAN COMMISSIONER OF THE INTERNATIONAL INSTITUTE OF AGRICULTURE.

The International Institute of Agriculture continued unabated its activity during the year 1914-15 despite the fact that the great war in progress for eight months of that year involved so many of the adhering countries. The Permanent Committee of the Institute continued its meetings as usual, attended by the delegates of nearly all the nations. At the meeting held on March 17, 1915, there were present the representatives of Great Britain and Ireland and the British Dominions, France, Germany, Belgium, Austria, Serbia, and Japan, together with those of most of the neutral countries. The personal relations between the delegates are reported to have been cordial and satisfactory. At the meeting on October 31, 1914, the president, Marquis Cappelli, referred in dignified language to his grief "at the catastrophe which has befallen Europe; the difficult and noble mission the Institute had to perform in assisting the States to repair the immense losses produced by the war when ended."

The president stated that from various sides and several Governments he had received "heartly encouragement to continue the work, and was grateful to them and all the delegates, especially those of the belligerent countries, for returning to resume their work of peace and progress while the cannon is still roaring; a most hopeful sign of our civilization; an affirmation of human solidarity in spite of the terrible events which seems to deny it."

At the meeting of the Permanent Committee of the Institute in March, 1914, much attention was given to carrying out the resolutions passed by the General Assembly of 1913, and to making preparations for the next General Assembly which was then expected to meet in May, 1915. It was announced that the Institute had communicated with the different Governments with a view to establishing a system under which it would be possible to publish the crop reports at an earlier day in each month than at present.

It was decided by the committee that arrangements should be made for the periodical publication of the rates of freight for agricultural produce between the chief exporting and importing ports. In connection with this question it was

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announced at the meeting of the committee in October, 1914, that the Senate and House of Representatives of the United States had passed a joint resolution instructing their delegate to request the Permanent Committee to take steps to call together an international conference to consider the advisability of drawing up a convention for the establishment of an International Commerce Commission, having consultative, deliberative, and advisory powers regarding ocean trade and ocean freights, with the object of giving greater stability to the prices of agricultural produce throughout the world. At a later meeting it was decided that this proposal should form part of the programme of the next session of the General Assembly.

At the spring meeting it was decided to submit to the next General Assembly proposals for the publication of statistics of the production and consumption of milk and the trade in butter and cheese. It was also decided to publish in the "Bulletin of Agricultural and Commercial Statistics" information relating to the area and output of the hop crop. Since the production of hops varies considerably, it is of importance to hop growers to be in possession of reliable information concerning the crops of other countries, and the regular publication by the Institute of official data regarding the crop should tend to minimize the violent fluctuations in price which at present occur. The production of hops has considerable influence on the price of beer, and therefore on that of barley.

At a meeting of the Permanent Committee in December, 1914, the principal business was the consideration of certain proposals brought forward by the delegate for France in connection with a report which had been presented at the previous meeting by the delegate for Great Britain and Ireland on the Third International Congress of Tropical Agriculture. In that report the British delegate suggested that steps should be taken to bring to the notice of tropical countries the work done by the Institute in the interests of tropical agriculture. After discussion, the committee resolved that the Institute would address all countries, both those which have adhered and those which have not, pointing out that the Institute is bound to devote its attention to all questions relating to agriculture throughout the world, and describing the services already rendered by the Institute to colonial and tropical agriculture. It was further resolved that the Institute should put itself into communication with the International Association of Colonial and Tropical Agriculture with a view to aiding in carrying out the resolutions passed by the International Congresses. The staff of the Institute was instructed to study still more thoroughly than hitherto, questions connected with colonial and tropical agriculture.

During the year the Institute has continued as usual the publication of its three monthly bulletins: "The Bulletin of Agricultural Intelligence and Plant Diseases," "The Bulletin of Economic and Social Intelligence," and "The Bulletin of Agricultural and Commercial Statistics." There has been some delay in the issue of the English editions on account of a scarcity of translators, some of them having gone to serve their respective countries at the front. There have also been delays, of course, in the transmission of the bulletins from Rome to the Canadian office.

The second International Year Book of Agricultural Statistics was issued in December, 1914. It is much more comprehensive than the first Year Book. It con-

tains the statistics of the area and production of the principal crops, the numbers of live stock, the imports, exports, consumption, and prices of the principal agricultural products in the different countries during ten years up to and including the crops of 1912 in the Northern hemisphere and of 1912-13 in the Southern hemisphere. Unlike the previous Year Book the present one includes the statistics for countries not yet adhering to the Institute.

The Institute also issued during the year the International Year Book of Agricultural Legislation containing the important laws relating to agriculture passed by the different countries in the year 1913.

The Canadian office is charged with furnishing to the Institute the information required concerning Canada, and with republishing in Canada the information contained in the official bulletins, together with other information of a technical character derived from other foreign sources. This republication is done through the monthly "Bulletin of Foreign Agricultural Intelligence," the distribution of which has increased during the past year from 9,500 to 12,600.

The office has dealt with many inquiries on the part of Canadian agriculturists desiring more ample information than is contained in the summaries published. This service is made possible through a system of exchange of publications with various foreign Governments by reason of which the most important bulletins, reports, and books are collected and systematically catalogued in the library.

This library has recently, and especially during the past year, made marked progress. The various sets of dictionary-catalogue cards, numbering in all about 135,000, have now been classified and completed to date. These comprise: (1) a complete dictionary-catalogue set of cards for the publications of the United States Department of Agriculture up to date, and numbering about 19,000; (2) a complete dictionary-catalogue set of cards on agriculture comprising: (*a*) Cards for copyrighted books received by the Library of Congress since 1898; (*b*) cards for accessories by purchase, gift, or exchange, which have come to the Library of Congress since 1901, and to the Library of the Department of Agriculture since 1902; (*c*) cards for re-catalogued books on entomology; (*d*) cards for other books on agriculture, numbering in all about 64,000. Also cards in continuation of these sets to date.

In addition to these two sets the library has a set of cards representing the publications of the United States Agricultural Experimental Stations, numbering about 35,000; cards prepared and typed in the library representing publications received either by exchange, gift, or purchase, numbering about 16,000.

With such facilities at hand, bibliographies can be easily prepared. A number of these have been compiled during the past year, and have been acknowledged to be very valuable by the expert officials of this and other departments desiring technical information. These officials at the same time availed themselves of the considerable collection of agricultural literature on the library shelves, now numbering in books 2,026 and in unbound books and pamphlets 16,959. This collection, although comprising the most important publications from other foreign sources, includes a particularly comprehensive set of the United States agricultural literature issued by state as well as federal institutions, and by the leading colleges, universities, etc.

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An effort was made to catalogue the important publications in the various branches of the Canadian Department of Agriculture. Sixteen out of eighteen divisions responded favourably, and their respective publications are catalogued by author, subject, and title, as well as the location of each. Some investigators have taken advantage of these cards, which readily reveal the existence and availability of important books which may be consulted or purchased for permanent use, and the work if continued systematically ought to be generally valuable.

Foreign exchanges were received regularly with the exception of publications from Germany, Austria, France, and Belgium. All the publications received are arranged strictly by subject according to the extended Dewey system of classification. United States official publications are an exception, being kept by themselves.

THE PUBLICATIONS BRANCH.

To edit and publish *The Agricultural Gazette of Canada* and to distribute the publications of the department are the chief duties of the Publications Branch. In addition, the branch prepares and issues to the news and agricultural papers, articles and notices designed to encourage the adoption of improved methods and generally to further the interests of agriculture.

The first volume of *The Agricultural Gazette* was completed with the December number for 1914. Since then three numbers of the second volume have been issued. For much of the success that has attended the effort to bring together and publish facts relating to the activities and progress of organized agriculture in Canada, due credit must be given officials of the Provincial Departments of Agriculture and representatives of other agricultural organizations, whose co-operation has been freely extended from the first. The distribution of *The Gazette* that was, during 1914, confined largely to Dominion and Provincial legislators, the press, libraries and agricultural officials, has been extended to educational officials, including school inspectors and rural science teachers.

During the year there were sent to those on the respective mailing lists, and in response to individual requests, sixty-seven new publications of this department, and small editions of six bulletins issued by the International Agricultural Institute at Rome. The departmental publications included nine reports, thirteen bulletins, nine pamphlets, nine circulars, and three leaflets, besides twelve numbers of *The Agricultural Gazette*, eleven numbers of the Bulletin of Foreign Intelligence and the Agricultural War-Book.

The pieces of literature mailed exceeded in number those of the previous year by more than 700,000 copies, and made a total of 1,806,454. To the addresses on the mailing lists there were sent 153,680 copies of reports, 49,800 copies of *The Agricultural Gazette*, 605,870 copies of bulletins, and 414,858 copies of circulars and leaflets. To personal applicants, there were mailed 26,805 copies of reports, 150,865 copies of bulletins, and 213,332 copies of pamphlets and circulars. To branch Experimental Farms and Stations and other outside government offices there were forwarded to be distributed therefrom, 3,450 copies of reports, 20,530 copies of bulletins, and 151,264 copies of circulars. Of the Agricultural War-Book 16,000 copies were distributed.

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In the campaign to encourage a greater production of crops, the Publications Branch did a share of the work. Besides preparing a portion of the material for the Agricultural War-Book, this branch looked after the distribution of this book, as already stated. It also got out new editions and reprints of certain bulletins to meet the demand created by the "Patriotism and Production" conferences and the campaign of agricultural advertising that was carried on.

The addressing of envelopes for the mailing lists is done by machinery, while publications sent out on request have to be addressed by hand. At the end of the fiscal year, for the several mailing lists, there were in use 202,000 embossed stencils. During the year 22,000 stencils were made, each representing a new name added, while 11,000 addresses were changed. During this period, 7,000 names were removed from the lists. These latter were of persons who had died, moved to unknown addresses, or for other causes failed to receive the publications from the post office. The number of envelopes addressed from stencils was 851,500. In some of these, two or more publications were mailed.

As a means of advertising publications, a press notice of each new bulletin and report issued was printed on a multigraph machine and sent out to upwards of 800 papers. It was from this source that most of the personal applications were received. The generous co-operation of the press in connection with this work is acknowledged. In addition, from time to time, there were sent out articles teaching useful lessons in agriculture. These with press notices and circular letters, made a total of 53,500 copies printed and issued during the year.

The staff employed in the branch includes twenty permanent and six temporary employees, made up of fourteen clerks, four messengers, and eight packers.

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III. PATENTS OF INVENTION.

The following tables show the transactions of the Patent Office, Department of Agriculture, from April 1, 1914, to March 31, 1915:—

Applications for Patents.	PATENTS AND CERTIFICATES GRANTED.			Caveats.	Assignments of Patents.	Notices under Sec. 8.
	Patent.	Certificates.	Total.			
7,302	6,867	1,211	8,078	391	3,391	1,021

PATENT OFFICE FEES FOR YEAR 1914-15.

1914 and 1915.	Amount received.	Notices.	Patents.	Assign- ments.	Certified copies.	Caveats.	Sundries.	Subscrip- tions.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
April.....	19,338 90	185 55	17,625 90	1,018 05	246 40	217 50	10 00	35 45
May.....	20,403 65	168 50	18,644 05	802 35	290 30	226 15	31 00	241 60
June.....	18,608 00	152 00	17,008 45	981 50	293 65	70 00	25 00	77 40
July.....	16,274 20	175 00	14,968 45	647 85	279 30	159 90	12 20	31 50
August.....	14,624 40	140 00	13,565 00	603 00	192 20	103 10	14 00	7 10
September.....	11,818 05	187 00	10,690 90	603 20	179 10	115 00	33 00	9 85
October.....	14,056 90	149 90	12,763 95	660 15	236 75	150 00	35 00	61 15
November.....	13,959 97	201 70	12,753 75	548 12	254 25	135 00	12 00	55 15
December.....	13,041 15	176 00	11,845 70	579 50	119 50	165 15	10 60	65 70
January.....	15,607 60	156 15	14,319 25	717 15	150 55	230 10	4 00	30 40
February.....	14,158 40	156 00	12,658 20	746 75	245 55	295 00	16 00	40 90
March.....	18,136 85	193 90	16,465 00	764 25	222 35	275 15	20 50	196 20
	190,028 37	2,041 80	173,308 60	8,670 87	2,789 90	2,142 05	222 80	852 35

NATIONALITY OF FOREIGN INVENTORS.

Countries.	1909.	1910.	1911.	1912.	1913.	1914.	1915.
United States of America.....	4,602	5,021	4,885	4,997	4,964	5,220	4,645
Great Britain and Ireland	346	392	359	506	495	558	450
Germany.....	215	241	304	336	307	300	107
Australia.....	58	60	77	99	75	76	76
France.....	59	75	97	108	100	115	83
New Zealand	36	37	33	46	47	50	29
Sweden.....	40	39	54	52	64	40	40
Belgium.....	17	20	25	20	23	33	19
Austria.....	33	23	20	24	40	35	11
Italy.....	10	8	12	6	16	14	15
Switzerland.....	11	12	26	23	20	22	14
Denmark.....	8	8	5	14	15	16	11
Transvaal.....	12	12	16	10	7	1	3
Hungary.....	5	7	6	6	6	5	5
Russia.....	4	14	18	6	17	13	9
Norway.....	9	18	20	17	10	32	24
Newfoundland.....	1	2	3	1	2	1	1
Netherlands.....	4	0	0			7	4
Mexico.....	4	11	7	10	8	7	4
Cape Province.....	1	0	3	4	4	1	0
Cuba.....	0	1	5	1	1	9	3
Spain.....	2	1	3			1	1
Chile.....	1	0	1		1	0	0
Finland	1	0	1		1	0	0
Portugal	1	0	0			0	1
Roumania.	1	0	1	1		0	1
Grand Duchy of Luxemburg	1	0	0			0	3
Algeria.....	0	0	1			0	0
Japan.....	1	2	0	2	2	1	3
India	0	0	5	3	1	7	3
Natal	0	0	0	1	2	0	0
Nicaragua	0	0	1			0	0
Brazil	0	0	2	1		1	3
Turkey.....	0	0	0			0	0
Poland.....	3	2	0			0	0
Holland.....	0	2	11	8	7	8	5
Argentine Republic.....	4	5	1	1		2	3
Panama (Canal Zone).....	2	0	0	3		3	0
Egypt.....		1	1			1	1
Southern Rhodesia		1				0	0
Peru				3	2	0	0
Hawaii.....				3	3	0	0
Venezuela.....				2	1	1	0
Trinidad.....				1		0	0
Porto Rico				1	2	0	0
Tunis.....					1	0	0
Ceylon.....					1	0	0
Straits Settlements.....					1	0	0
Phillipine Islands.....						1	1
Canary Islands.....						1	0
Java.....						1	0
Channel Islands.....						1	0
China.....							1
West Indies							1
Isle of Man.....							1
Norfolk Islands (South Pacific).....							2
Alaska.....							2
Bermuda							1

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The total number of patents granted to Canadian inventors was 1,281, and were distributed among the provinces of the Dominion as follows:—

Ontario.	Quebec.	British Columbia.	Manitoba.	Alberta.	Saskatchewan.	New Brunswick.	Nova Scotia.	Prince Edward Island.	Yukon.
586	278	126	97	71	66	20	33	2	2

Patents issued to residents of Canada, with the ratio of population to each patent granted:—

Provinces.	Patents.	One to Every.
British Columbia	126	3,115
Yukon	2	4,256
Ontario	586	4,306
Manitoba	97	4,697
Alberta	71	5,277
Quebec	278	7,206
Saskatchewan	66	7,461
Nova Scotia	33	14,919
New Brunswick	20	17,594
Prince Edward Island	2	46,864

Statement of the number of patents issued under the Act, on which the fees are paid for periods of six, twelve, or eighteen years, at the option of the patentee; and of patents on which the certificates of payments of fees were attached after the issue of patents originally granted for periods of six and twelve years:—

Period for which fees were paid on first issue.			Patents on which Certificates were attached after issue.		Reissues.		
6 years.	12 years.	18 years.	6 years.	12 years.	6 years.	12 years.	18 years.
6,851	1	15	1,188	23	7	0	0

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COMPARATIVE STATEMENT of the transactions of the Patent Office from 1907 to 1915 inclusive.

Year.	Applica- tions for Patents.	PATENTS AND CERTIFICATES GRANTED.			Caveats.	Assign- ments of Patents.	Fees received.
		Patents.	Certifi- cates.	Total.			
							\$ cts.
1907.....	7,077	6,121	634	6,755	285	3,003	169,548 78
1908.....	7,406	6,774	744	7,518	317	2,900	178,482 49
1909.....	7,239	6,395	827	7,222	319	3,001	176,692 05
1910.....	7,789	7,223	1,010	8,233	448	3,147	194,571 54
1911.....	8,037	7,249	1,002	8,251	406	3,256	200,164 41
1912.....	8,293	7,399	1,113	8,512	348	3,725	207,762 77
1913.....	8,681	7,502	1,199	8,701	353	3,741	218,125 02
1914.....	8,359	7,918	1,323	9,241	354	3,432	215,001 71
1915.....	7,302	6,867	1,211	8,078	391	3,391	190,028 37

The total number of reports issued by the examiners during the year was 11,285 and 7 patents were surrendered and reissued.

Out of the total number of patents granted by this office during the year there were 4,645 issued to inventors or assignees resident in the United States, being 67 per cent of the whole issue.

This branch of my department continues to receive the official reports of patents from Great Britain, Australia, New Zealand, United States, Mexico, Portugal, Italy, Belgium, France, and Japan, in addition to other periodicals of a scientific nature, in exchange for the Canadian Patent Office Record.

There were 1,857 patents brought under the conditions of the compulsory license clause, section 44 of the Patent Act.

The number of notices under section 8 of the Patent Act was 1,021.

IV. COPYRIGHTS, TRADE MARKS, INDUSTRIAL DESIGNS AND TIMBER MARKS.

STATEMENT OF FEES received by the Copyright and Trade Mark Branch from April 1, 1914, to March 31, 1915.

Month.	Trade Marks.	Copyrights.	Designs.	Timber Marks.	Assign- ments.	Copies.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
1914.							
April.....	4,026 45	160 80	97 00	6 00	48 20	33 10	4,371 55
May.....	3,805 65	241 25	150 00	3 00	54 50	65 00	4,324 40
June.....	4,241 25	173 00	99 00		40 50	59 25	4,613 00
July.....	2,988 80	126 50	105 15	2 00	26 50	43 75	3,292 70
August ...	2,384 90	149 80	146 15	2 00	15 00	34 00	2,731 85
September...	2,010 15	151 75	93 00	6 00	16 00	25 50	2,305 40
October.	2,314 36	175 00	130 00		42 00	22 00	2,683 36
November. ..	2,924 36	134 50	65 10		84 00	23 50	3,231 46
December. ...	2,873 80	222 00	170 00	35 00	24 00	24 75	3,349 55
1915.							
January.....	2,511 20	148 60	70 00	15 00	37 00	10 50	2,792 30
February....	2,241 55	205 65	114 00	6 50	263 65	20 75	2,852 10
March... ..	2,653 65	201 47	132 15	2 25	21 00	41 50	3,052 02
Total	34,976 12	2,000 32	1,374 55	82 75	672 35	403 60	39,539 69
Refunds. .	6,594 27	45 05	102 00	2 00	9 50	6 00	6,758 82
	28,381 85	2,045 27	1,272 55	80 75	662 85	397 60	32,840 87

The particulars of the registrations made by the Copyright and Trade Mark Branch of the Department of Agriculture during the year ended March 31, 1915, are as follows:—

I. Copyrights—	
Full copyrights without certificates..	1,301
Full copyrights with certificates...	180
Temporary copyrights without certificates..	45
Temporary copyrights with certificates..	4
Interim copyrights without certificates..	86
Interim copyrights with certificates..	9
Renewals of copyrights..	23
Assignments of copyrights..	27
	<hr/> 1,675
II. Trade Marks..	1,106
Renewals of specific trade marks..	40
Assignments of trade marks..	171
III. Industrial Designs..	224
Renewals..	8
Assignments..	40
IV. Timber Marks...	24
Assignments..	1
	<hr/>
Total registrations...	3,292

The following tables shows a comparative statement of the business of this branch from 1903 to 1914, inclusive:—

Year.	Letters Received.	Letters sent.	Copyrights Registered.	Certificates of Copyright.	Trade Marks Registered.	Industrial Designs Registered.	Timber Marks Registered.	Assignments Registered.	Fees Received.
1903	2,687	3,211	900	176	557	38	23	272	18,086 25
1904.....	2,858	3,293	1,106	228	621	107	25	118	20,647 30
1905	3,367	3,902	1,130	189	661	139	22	154	23,706 75
1906	5,340	5,193	1,228	169	1,119	125	47	282	33,107 10
1907.....	4,475	4,353	1,140	175	848	182	33	136	30,073 20
1908	6,647	4,980	1,416	170	892	162	44	343	37,514 00
1909.....	6,320	5,750	1,535	171	1,059	143	108	174	38,071 31
1910.....	6,411	7,688	1,699	206	1,021	118	39	386	42,153 76
1911.....	7,027	7,091	1,593	213	1,212	149	39	230	46,327 86
1912	9,435	9,322	1,760	205	1,315	128	15	559	51,043 21
1913.....	8,441	9,220	1,835	207	1,378	165	57	264	49,409 68
1914	8,190	9,292	1,675	193	1,106	224	24	242	39,599 69

V. PUBLIC HEALTH AND QUARANTINE.

By the continued efforts of the Public Health branch, and the skilled watchfulness of the officers working day and night upon our coasts and frontier, the people of Canada have been saved again this year from the inroads of epidemic disease from abroad.

At the coast quarantine stations on the Atlantic and the Pacific, 253,608 persons have been inspected. Along the international frontier between this country and the United States it has been necessary to place—from time to time and at various inland ports of entry—temporary medical quarantine inspectors to prevent the introduction of disease into Canada.

A total of 543 persons were admitted into hospital at the various stations.

In every instance the disease was stamped out at the station, and so prevented from appearing inland.

Asiatic Cholera.—During the past year this disease has been reported in the following countries: Austria-Hungary, Ceylon, China, Dutch East Indies, Germany, Greece, India, Indo-China, Japan, Persia, Philippine Islands, Russia, Siam, Straits Settlements, Turkey in Asia, and Turkey in Europe.

Reports from southern Austria and northern Hungary speak of an epidemic of this disease of extraordinary violence amongst the soldiers and persons in contact with them, accompanied by a large percentage of deaths.

This disease is also present in other parts of the European war zone.

Bubonic Plague.—This disease has been reported during the year in the following countries: Brazil, British East Africa, Ceylon, China, Cuba, Dutch East Indies, Ecuador, Egypt, German East Africa, Great Britain, Greece, Hawaii, India, Indo-

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China, Italy, Japan, Mauritius, Persia, Peru, Philippine Islands, Portugal, Russia, Senegal, Siam, Straits Settlements, Tripoli, Turkey in Asia, Union of South Africa, United States, and Zanzibar.

In the United States thirty cases of human plague were reported in New Orleans from June to December last. The number of rats captured was 112,716; examination of 92,104 of these showed 181 rodent cases present. The finding of a plague-infected rat at New Orleans was reported on March 9, 1915.

In California there was a case of human plague last June. The origin of the infection here was undoubtedly ground-squirrels, as the patient had been engaged in cutting hay on squirrel infested lands on which infected squirrels were found, and had also shot and skinned some of them.

It is stated that since the discovery of plague amongst ground squirrels in August, 1908, its presence has been demonstrated on 258 ranches.

At Seattle, Wash., U.S.A., the finding of plague-infected rats has been reported on April 7 and 20, May 8 and 26, October 22 and 31, November 2 and 9, 1914, and on January 11, 1915. In consequence of this, I have in no degree relaxed the enforcement of the special regulations governing such conditions, as detailed in my last two annual reports.

In Java during last October there were 1,661 cases with 1,474 deaths.

In Hong Kong, during the last year, there have been 2,147 cases of plague, with 2,023 deaths.

In India, between January 4 and October 17, 1914, 270,242 cases of plague were reported, with 226,104 deaths.

Smallpox.—This disease has again had a practically world-wide appearance during the year. Cases of it were reported on three incoming vessels at the quarantine station at Grosse Isle in the river St. Lawrence. The disease was in each case stamped out at the station.

Epidemic outbreaks of this disease in the bordering states of Minnesota and Michigan, U.S.A., had caused me prior to my last annual report to institute an international medical quarantine frontier inspection at Rainy River, Emo, Fort Frances, and Sault Ste. Marie. These were still in force at the date of my last report. I was enabled to raise them all on May 31, 1914.

Owing, however, to recurrence of the disease in epidemic form in North Dakota and Minnesota, I instituted a similar frontier inspection at Emo and at Fort Frances, Ont., on December 16, 1914; at Gretna, Man., on December 26, 1914; and at Rainy River, Ont., on January 2, 1915. These inspections are still in force.

Typhus Fever.—Except in parts of Russia and, to a limited extent, in some of the large cities of Europe and Asia, this disease has been fairly dormant for nearly half a century. Within the last two or three years, however, it has shown marked signs of recrudescence. Cases have been brought once again to our quarantine stations, and to those also of contagious ports in the United States.

Two vessels brought this disease to the quarantine station at Grosse Isle in the river St. Lawrence, this year.

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This disease is now stated to be raging in Serbia and in Austria. The deaths from it amongst the soldiers are already said to exceed 50,000. In hospital work in Serbia alone, 192 physicians have already perished. Budapest is also a hotbed of the disease, and in Przsmysl on the 20th of the month, March, 1915, there were stated to be 15,000 cases.

Leprosy.—There are at present in the Leper lazaretto at Tracadie, N.B., sixteen leper patients, the smallest number for years; seven males and nine females. Twelve French Canadian (or Acadian) origin, two of English, one of Icelandic, and one of Russian. Amelioration of symptoms and sufferings is claimed to be following the system of treatment now being carried out at the Lazaretto. The two former inmates discharged, apparently cured, in 1912, remain in good health.

There were four deaths during the year, and one new patient was admitted.

Beriberi.—The literature and quoted experience of the year have added to the proof that beriberi is definitely one of the “deficiency diseases,” and that the question of its complete eradication is merely one of the supply of the proper food in the places in which the disease occurs, together with the persuasion of the people to use the food thus supplied.

Enteric Fever.—Facts as to the efficacy of anti-typhoid inoculation accumulate almost daily. In the armies of the world, Great Britain, the United States, France, Italy, and Japan, the results of the method have been conspicuously brilliant. This so-called vaccination against this disease has spread into Spain, Portugal, the Canary Islands, England, Belgium, Denmark, Switzerland, Egypt, Italy, Sicily, Greece, Roumania, Russia, Turkey in Europe, Turkey in Asia, the United States, Canada, Columbia, Costa Rica, Ecuador, Guatemala, Venezuela, Brazil, Argentine, and Uruguay.

Change in Medical Staff.—At the date of my last annual report there was a vacancy in the position of assistant medical officer and bacteriologist at the quarantine station at William Head, B.C. To this office on May 1, I appointed Dr. Alfred G. Long, but allowed him to resign, as finding the work and exposure too great for him on June 4. On June 17 I filled the office by the appointment of Dr. Chester P. Brown, who is performing the duties very satisfactorily.

I regret having to say that Dr. A. A. McLellan, the Quarantine Officer at Summerside, P.E.I., died on the 20th instant.

Circulars.—Circular letters were issued from time to time to the different officers, drawing their attention to the various matters during the year connected with the appearances and movements of epidemic diseases abroad.

Public Works Health Act.—Both the inspectors under this Act—Mr. C. A. L. Fisher for Eastern Canada, and Dr. A. E. Clendenan for Western Canada—report that the general health conditions have been unusually good this year amongst the men employed in the various works of railway, tunnel, canal, and irrigation construction coming under their inspection. As a rule the sanitary condition of the camps

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was good, the medical service adequate, the hospital accommodation excellent, and the sleeping quarters and boarding of the men fully equal to the good conditions reported previously.

Aftermath of the War.—History tells us war is ever accompanied and followed by pestilence. The present war, with its carnage quite unprecedented in the history of the world, and its enormous aggregations of troops, etc., is already proving the truth of this in spite of the advances of modern sanitary science. Cholera, plague, and typhus fever are reported to be spreading steadily.

There is for this country the immediate danger of disease being brought by invalided or other soldiers returning from the war zone. Then the danger upon the return of our forces at large when the war is over, and demobilization takes place. And finally the possibility of a large immigration after the war. As Earl Grey has recently expressed it, thousands of young men hitherto accustomed to office work will never find such occupation congenial after the active life now being experienced. Consequently, the wider life which the overseas Dominion offer will appeal to them.

On these accounts, the quarantine service at our different ports promises from now on to assume even greater importance than ever before.

The whole respectfully submitted.

MARTIN BURRELL,
Minister of Agriculture.

PUBLIC HEALTH.

APPENDIX No. 1.

REPORT OF THE DIRECTOR-GENERAL OF PUBLIC HEALTH.

F. D. MONTIZAMBERT, I.S.O., M.D.EDIN., F.R.C.S.E., D.C.L.)

March 31, 1915

SIR,—I have the honour to submit this my report as Director-General of Public Health for the year ending this day.

Asiatic Cholera.—Since my last annual report this disease has been reported in the following countries: Austria-Hungary, Ceylon, China, Dutch East Indies, Germany, Greece, India, Indo-China, Japan, Persia, Philippine Islands, Russia, Siam, Straits Settlements, Turkey in Asia, and Turkey in Europe.

Epidemics of cholera are reported to be threatening the various armies, especially those engaged on the Russo-Austrian frontier. But it will be remembered that even in the normal state of affairs cases of Asiatic cholera in this neighbourhood are not unusual. Cholera is a disease whose spread is dependent largely on infected drinking water and carriers, apparently healthy. So far as is known, infection occurs only through the alimentary tract; this is to say, the germ must be swallowed. It seems probable that in addition to water as a source of infection, food when exposed may become contaminated with the organism—as for instance through the agency of flies. The germ is passed with the fæces, and unless there are efficient sanitary precautions, water supplies are likely to become infected. Therefore, in the passage of large bodies of troops, when sanitation cannot be perfect, an outbreak of this disease may be expected. The cholera organism, the comma bacillus, is especially sensitive to drying, and there seems to be a doubt whether or not it is able to multiply outside of the body in impure water. In the recent Balkan war cholera was reported in many places and many cases occurred, but the disease never became epidemic. With the assistance of the highly efficient sanitary services of modern armies, widespread epidemics of such diseases may be prevented. Soldiers are observed carefully, and in efficient camps a soldier who has frequent stools is reported to medical officers, isolated and his symptoms watched. It has been suggested that the coming of winter may lend aid in preventing the spread of cholera. However, the increased moisture and seepage of surface water carrying contaminating material, as well as the closer contact of human beings engendered by the winter season, make infection still more likely. As an aid to protection, active immunization of men with the Haffkine vaccine may be practised. Possibly conditions in this war will be the means of determining still more exactly the status of this protective measure.

Travellers from Southern Austria report a shocking condition among the cholera patients and wounded arriving from the front. The men are described as lying on filthy straw, destitute of sanitary accommodations. The attendants of cholera patients are permitted to go to the homes of relatives without any precautions against contagion having been taken, according to the travellers. There are not sufficient physicians to care for the ill and wounded, as many medical men have been killed on the battlefield. They have made a practice of seeking the wounded, accompanied by police dogs, and so are made easy marks for Serbian sharpshooters.

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On Wednesday in a large town and district in Northern Hungary, the despatch says, "there were ten thousand cases among the soldiers and persons having been in contact with them. The epidemic is extraordinarily violent, and a large percentage of the stricken persons die after a few hours."

Between October 18 and November 21, 2,705 cases, with 754 deaths, were reported.

On cholera in Manila, Philippine Islands Doctors Goff and Denny report to the *Medical Record* as follows:—

After an absence of four months, cholera appeared in the city of Manila in July, 1914. The present epidemic, in which there were reported more than 1,100 cases, suspects and "carriers," did not differ greatly from the ordinary small epidemic. All patients, excepting those who died without medical attention, were treated at San Lazaro hospital.

Of the number mentioned, 330 were genuine cases of cholera, 170 not cholera, and 570 were carriers, so-called; ninety-nine were found dead and sent to San Lazaro morgue for confirmation of diagnosis. The total number of deaths with and without medical attention was 190.

The percentage of recoveries among those receiving medical attention at San Lazaro was 72.5.

When a patient is admitted to the hospital, a stool specimen is at once taken and sent to the Bureau of Science for bacteriological examination, and no patient is discharged until at least two successive stool specimens taken on different days are reported negative for cholera vibrio.

When a case is beyond doubt clinically cholera, it is carried on the hospital records as cholera, and a case pronounced cholera at necropsy is taken up as such. When a case is merely possible or even probable cholera, either clinically or at necropsy, the final diagnosis depends entirely on the laboratory findings, so that there is little chance for error in the ultimate status of a case. The clinical diagnosis of Asiatic cholera was confirmed bacteriologically in 85 per cent of the cases.

In the recent occurrence of cholera in Bilibid Prison, out of a total daily average of some 2,400 prisoners, eighty-four have been found by the Bureau of Science to be positive cholera carriers, or 3 per cent. Of these carriers, who were held in complete isolation, four developed cholera after being found to be carriers. One developed the disease four days after being found positive, one sixteen days, one seventeen days, and one eighteen days. In the quarantined cell houses, cases have occurred at from two- and three- up to twelve- and thirteen-day intervals. At the San Lazaro detention camp one cholera carrier developed an attack of the disease twenty-one days after being found positive. All this has an intensely practical bearing as it illustrates the futility of the usual five-day quarantine as an effective safeguard against the spread of cholera in a very respectable percentage of infections. It also explains very many outbreaks most difficult to understand under the old hypothesis of a five-day incubation period of cholera. Also it very clearly shows the absolute necessity in fighting cholera in looking for the infection outside of the actual cholera cases.

In the present outbreak in Manila, the search for cholera carriers is being prosecuted at the rate of about two thousand examinations a day, and about twice as many carriers as actual cases have been found and isolated. These carriers require about two weeks, on an average, to clear up, and it is evident that if allowed to remain at large they would be a far greater danger to the public safety than actual cases. Indeed, it is believed by Major Munson, acting director of health, that a most serious epidemic in Manila has been averted only by the systematic and persistent searching out and isolation of the cholera

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carriers. No effort is being made to examine the population as a whole for cholera; but all contacts with cases, all residents of a vicinity where a number of cases have occurred, and all persons handling food are examined.

Wolter alludes to recently expressed beliefs in connection with cholera incidence in the Balkan war, that sudden explosions of the disease can only be explained by contact infection; but while one author assigns relatively small importance to this factor, another regards it as of paramount significance. The fact that one body of troops may fall victim to the disease, while another close at hand may show no morbidity whatever from the same, naturally suggests contagion rather than local factors of time and space. But sharp local demarcation has always characterized the incidence of the cholera epidemics. Local outbreaks appear to stand in relation to certain river valleys, and it has often been noted that after removal from certain localities the visitation ceases. The author cites many accounts of the recent epidemic appearance of cholera, and carefully avoids any reference to bacteriology. While drinking water epidemics are mentioned, there is hardly any consideration of the exact transmission of the disease. The latter, however, is grouped rather with typhoid and dysentery, than with typhus, in which contact infection is the sole channel of transmission. Dealt with along old epidemiological lines, the question of propagation lies between contact infection, fomites, and purely local conditions. The latter includes soil water, drainage, the weather, and other purely external factors. In the epidemic transmission of diseases, the simple elements which explain sporadic transmission naturally fall short in accounting for the facts, just as they fail to explain the severity and mildness, and the self-limitation of epidemics.

Bubonic Plague.—This disease has been reported during the year in the following countries: Brazil, British East Africa, Ceylon, China, Cuba, Dutch East Indies, Ecuador, Egypt, German East Africa, Great Britain, Greece, Hawaii, India, Indo-China, Italy, Japan, Mauritius, Persia, Peru, Philippine Islands, Portugal, Russia, Senegal, Siam, Straits Settlements, Tripoli, Turkey in Asia, Union of South Africa, United States, and Zanzibar.

The *Journal* of the American Medical Association published, on January 2 last, the following article on the pneumonic form of this disease:—

The outbreak of the great pneumonic plague in Manchuria a few winters ago afforded the first larger opportunity to study the pathologic anatomy of this disease and to examine histologically the lesions that are produced by it. To the earlier reports, and particularly to those of the American investigators, Strong, Crowell, and Teague, are now added the notes collected by Dr. Wu Lien-Teh, director and chief medical officer of the North Manchurian Plague Prevention Service, and Prof. G. Sims Woodhead of the University of Cambridge, England.

They believe that the specimens examined by them afford evidence of the presence of an extremely acute septicæmic condition in pneumonic plague. The heart is evidently affected by very active toxins. The liver shows typical examples of lesions produced by specific infective micro-organisms that give rise to toxic substances. The epithelium of the kidneys is modified by a similar toxic activity. It is stated that in the lungs the lesions are far less marked than one would expect were pneumonia the main or most important factor in the disease. The descriptions in the literature of the subject indicate that in plague at least two types of pneumonia, and perhaps even further modifications of these types, are to be dealt with. They differ materially from that set up by the *Diplococcus pneumoniae*, which was never found in the tissue sections.

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The views of these latest investigators on the mode of infection is of more general interest. They conclude that in the Manchurian outbreak the amount of the infective material, that is, the dose of the plague bacillus, gaining access to the upper respiratory passages—to the tonsils, fauces, etc.—is of prime importance in determining the character of the septicæmia or bacteriæmia resulting from a pulmonary infection. It is suggested that in warm countries where the people live in the open and where the facilities and channels by which infection is communicated appear to be those provided by rats and fleas, and where the plague material is carried more directly from one patient to another, or from the rat, by the flea, to the human subject, the local reaction of the tissues and the bubo may prevent the extension of the bacteria, especially if the dose is small and the septicæmic condition occurs at a comparatively late stage. If there is a good reaction of resisting tissues the disease may never become septicæmic. If, however, the septicæmia once develops, it is evident that the internal organs are affected much as in the pneumonic form of plague.

Applying their contentions directly to the Manchurian epidemic, which was at its height in the winter, Lien-Teh and Woodhead argue that the facilities for the inhalation or ingestion of large numbers of plague bacilli were far greater than they can possibly be in warm countries where people live in the open. The patients, residing in badly ventilated houses, closed because of the intense cold, and artificially heated, may be regarded as living in highly infected incubators of the most approved kind. Septicæmias are rapidly developed; and although the lung may in a certain proportion of cases be the primary seat of infection, the late lung symptoms observed seem to point to the occurrence of a secondary pneumonia in a certain proportion of the cases examined clinically.

We have already referred to Teague's views regarding the spread of pneumonic plague. The essence of the contentions put forth in the contribution from the Cambridge pathologic laboratory consists in ascribing the fatal severity of the Manchurian epidemic to the fact that the dose of infective material was always massive, and entered by always open and slightly resistant portals. Under such conditions the prognosis is bad. When the advance of the *Bacillus pestis* is so interfered with that not only a local, but a general immunity may be acquired before the bacilli can reach the blood in any considerable numbers, the virulence is greatly lessened.

Cuba: In the same number of the *Journal*, Dr. G. M. Guiteras, Surgeon, United States Public Health Service, gives the following report upon plague in Havana:—

The first case of plague known to occur in Havana, Cuba, was discovered July 6, 1912, in the person of a Spaniard residing at No. 2 Mercaderes street. Two additional cases occurred July 12 and 22 at Justiz and Baratillo streets, about four blocks distant from the first case. The district involved in this infection is about three blocks from the water front and in the wholesale commercial district of the city.

The infection was at first supposed to have been imported from Porto Rico, the capital of which, San Juan, was at the time plague infected. Subsequent investigation, however, by the Cuban health authorities, indicate that the infection was a direct importation from the Canary Islands, where plague was present at the time, though concealed and stubbornly denied by the Spanish authorities.

Owing to the early discovery of the disease, and the thorough and excellent work of the Cuban Sanitary Department, this outbreak was confined to the three cases mentioned above.

About one year and a half later, that is, February 22, 1914, the first case of plague of the present outbreak was discovered in Havana at No. 1 Oficinas

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street, which is in the block adjacent to that in which the first two cases occurred in 1912. Whether this second appearance of plague was simply a continuation of the old infection or a new importation is a moot question. The former is the more reasonable view, and is supported by Dr. Juan Guiteras, Director of Health of Cuba. The case of February 22 was followed by twenty-four other cases, making a total of twenty-five within the city of Havana. The last case occurred June 22.

Two other cases were found in the neighbourhood of Havana, the first at Artemisa, 45 kilometres to the southwest of the city, April 18, the second at San Jose de las Lajas, a town about 25 kilometres southeast from Havana, June 15. As the infection in both these cases was clearly traceable to Havana, and they were treated in that city, these properly belong with the Havana series.

May 30 an infected rat was found in the freight station in the town of Jaruco, 37 kilometres to the eastward of Havana on the railway between that city and Matanzas. The station and surrounding structures were disinfected, and there were no further developments.

June 23 a case suspicious of plague was reported from Santiago de Cuba in the eastern extremity of the island. Later it was confirmed, after inoculation tests and the exposure of guinea-pigs in the infected locality had shown positive results. Plague-infected rats were found about the same time.

It may be considered as more than probable that the spread of plague infection outside of the original focus in Havana was due to the action of a Mr. Gonzales, a wholesale provision merchant who, when one of his employees sickened with what he thought might be plague, and later was confirmed as such, concealed it, and, knowing that as soon as the case was discovered his warehouse would be quarantined and fumigated, disposed of as much of his stock as possible, sending it to various parts of the city of Havana and throughout Cuba, including the subsequently infected points, San Jose de las Lajas, Jaruco, and Santiago de Cuba. He is at present being prosecuted before the courts.

It should be observed that two weeks prior to the appearance of the first case of the present outbreak in Havana, the sanitary authorities had noted some rat mortality. Anti-rat measures were put into effect at once, even before the discovery of the first human case of plague. With a few exceptions, all the cases may be traced directly or indirectly to the original focus near the Havana water front.

A secondary well-marked focus developed later in the extensive stables of the Department of Public Works in Figuras street. Two infected rats were found here, the first, April 17, the second, April 24. These are the only infected rats found in Havana. This focus gave rise to six cases.

On account of the character of the stable buildings and grounds, disinfection by the usual methods was futile, and the Sanitary Department decided to destroy the infection by fire.

The stables and everything within them, except the animals, carts and harness, were converted into ashes, April 25. This radical measure was effective in destroying a very menacing focus of infection. No other case developed from this source, except perhaps case 25, in which the place of business of the patient, No. 2 Concha street, was on the route taken by the employees, animals and equipment of the stables destroyed, when they were moving into new quarters.

A paper of New Orleans, U.S.A., published the following under date October, 12, 1914:

The Federal Government is helping this city to rid itself of rats, those carriers of the fleas that carry the bubonic plague.

On June 19 a case of bubonic plague was discovered here. A hurry call was sent to the Public Health Service, and a strenuous campaign was started to stamp it out. The Government was concerned in preventing its spread to other sections of the country. And the task is costing the Government \$27,000 a month.

There are three kinds of rats, but the worst is the Norwegian rat. He is the nomad of the rodent family, a militant brute that soon cleans out all others of his tribe. It is he who carries the flea whose bite causes the bubonic plague. And he carries it everywhere. Plague is thought to have reached New Orleans from the Orient via Liverpool, which trades largely with the east.

The rats are being exterminated with poison and with traps. Several expert rodentologists were brought from San Francisco, and they have trapped as many as 7,724 rats in a single week.

Thousands of rodents have been examined for infected fleas, and in all 121 plague stricken rats have been found. About twenty-five cases of plague among humans have developed, with six deaths. No new cases have been reported among humans for some time, but infected rats are constantly being trapped. A few days ago a Chinese restaurant was condemned and demolished, and in the process no less than thirteen rats bearing parasites were found.

The fight has been going on since early June, and the situation is now well in hand. Various bodies planning to hold conventions in New Orleans have been notified that the city is quite safe. But the battle is by no means over. The Norwegian rat is a hardy brute, and there is always danger of a fresh outbreak.

It is a herculean job to ratproof an ancient rabbit-warren of a city like New Orleans. The city has been divided into districts, each under the charge of a doctor of the Public Health Service, and a survey has been made of each district, of all rat-breeding or rat-harbours places noted; and now they are cleaning up the place. Holes are being stopped up; buildings raised or lowered so that they clear the ground sufficiently to allow free circulation of air and sunshine or else hug to it too closely to afford shelter to the rodent; walls and foundations are being fixed to keep the rats from getting through. Nuisances have been abated in over 1,000 places, and disinfectant and fumigation chemicals are being used liberally. Standing garbage, stable refuse and the like are anathema. Permits for keeping chickens are being revoked, for chicken feed is a great attractor of rats.

The wharves and docks and the railway freight yards are being gone over. Every ship before leaving the port is fumigated with sulphur or carbon monoxide. An attempt is being made to ratproof the wharves, but it is only partially successful, for a really ratproof wharf must be almost entirely of concrete.

New Orleans being a great distributing centre for freight for the west and southwest, an enormous number of freight cars must be inspected, ratproofed if necessary, or fumigated. In one week over 3,000 were inspected, of which seven were condemned.

Infant mortality, particularly from summer bowel complaints and the like, has fallen greatly since the beginning of the anti-plague crusade; so has the general death-rate.

The Federal Public Health Service has over two hundred men engaged in the work here.

A total of thirty cases of human plague was reported in New Orleans from June to December 25, 1914. The last case occurred September 30. The total number of rats captured up to October 10 was 112,716. Examination of 92,104 of these showed 181 rodent cases present.

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The finding of a plague-infected rat at New Orleans was reported March 9, 1915. The rat was found at a point eighteen squares distant from the nearest known point of infection.

California: In the Public Health Report of the United States Public Health Service, J. D. Long, Surgeon of that service, says:—

In order that a clear understanding may be had of the present situation with regard to plague in the state of California it will be necessary to review briefly the past history of plague in the state.

Plague was first reported in California about the year 1900, and from that time until 1904 cases occurred from time to time.

From 1904 until 1907 no case was reported.

In May, 1907 a sporadic case was reported at the Marine hospital. The outbreak proper began in August, 1907, and continued in the city of San Francisco until January, 1908. During this period 159 human cases occurred. During the same period fifteen cases occurred in Oakland, one in Berkeley, and one in Point Richmond. During the period from 1908 until the present time cases have occurred as follows in the counties outside of the cities above mentioned:—

	Cases.
Contra Costa county..	4
Alameda county..	2
Los Angeles county..	1
San Benito county	2
Santa Clara county	1
San Joaquin County	1

Total number of cases, 187.

In the last human case of plague to occur in California the patient sickened at Walnut Creek, Contra Costa county, in May, 1914, and made an uneventful recovery. This case was mild and typical.

During the period from August, 1907, to October, 1908, 398 plague-infected rats were found in the city of San Francisco, and from September, 1907, to December 1, 1908, 125 plague-infected rats were found in the city of Oakland.

In August, 1908, the discovery was made that plague existed among the ground squirrels, which have heretofore so plentifully infested the lands comprised in the rural districts of California. Since that time a total of 1,957 plague-infected squirrels has been found, scattered over an area of approximately 13,000 square miles, which comprises the counties of Contra Costa, Alameda, San Joaquin, Stanislaus, Santa Clara, Santa Cruz, Monterey, San Benito, and Merced.

From August, 1908, to the beginning of 1912 the efforts of the United States Public Health Service and the California State Board of Health, acting in co-operation, were directed toward outlining or delimiting the area in which plague infection existed. For this purpose, hunting operations were conducted all over the state of California and in portions of Oregon, Nevada, and Arizona. No infection was found in any part of California except in the nine counties mentioned above, nor was infection found in any of the other states referred to.

With regard to the case of human plague which occurred at Walnut Creek, Cal., June 8, 1914, Surgeon Long states:—

The origin of the infection was undoubtedly ground squirrels, as the patient had been engaged in cutting hay on squirrel-infested lands. He had

shot and skinned squirrels within two weeks prior to his illness, and keeps a pet cat which has on several occasions captured young squirrels and brought them into the house.

Hunters detailed to the vicinity of the patient's residence have since discovered squirrels which present evidence of having been infected with bubonic plague.

Since the discovery of plague amongst ground squirrels in August, 1908, its presence has been demonstrated on 258 ranches. The following table from the United States Public Health Reports is of interest:—

Places in California.	Date of last case of human plague.	Date of last case of rat plague.	Date of last case of squirrel plague.	Total number rodents found infected since May, 1907.
Cities:				
San Francisco.....	Jan. 30, 1908	Oct. 23, 1908	(1)	398 rats.
Oakland	Aug. 9, 1911	Dec. 1, 1908	(1)	126 rats.
Berkeley.....	Aug. 28, 1907	(1)	(1)	(1)
Los Angeles.....	Aug. 11, 1908	(1)	Aug. 21, 1908	1 squirrel.
Counties:				
Alameda (exclusive of Oakland and Berkeley).	Sept. 24, 1909	Oct. 17, 1909	Aug. 7, 1914	286 squirrels, 1 wood rat.
Contra Costa.....	May 17, 1914	(1)	Oct. 23, 1914	1,565 squirrels.
Fresno	(1)	(1)	Oct. 27, 1911	1 squirrel.
Merced.....	(1)	(1)	July 12, 1911	5 squirrels.
Monterey.....	(1)	(1)	Apr. 10, 1914	6 squirrels.
San Benito.....	June 4, 1913	(1)	Sept. 26, 1914	36 squirrels.
San Joaquin.....	Sept. 18, 1911	(1)	Aug. 26, 1911	18 squirrels.
San Luis Obispo.....	(1)	(1)	Jan. 29, 1910	1 squirrel.
Santa Clara.....	Aug. 31, 1910	(1)	July 23, 1913	25 squirrels.
Santa Cruz.....	(1)	(1)	May 17, 1910	3 squirrels.
Stanislaus.....	(1)	(1)	June 2, 1911	13 squirrels.

(1) None.
(2) Wood rat.

The work is now being carried on in the following named counties: Alameda, Contra Costa, San Francisco, Merced, San Joaquin, Santa Cruz, Stanislaus, San Benito, Santa Clara, and San Mateo.

Passed Asst. Surg. Hurley reports the finding of two plague-infected ground squirrels in Contra Costa county, California, March 3 and 4, 1915.

At Seattle, Wash., U.S.A., the finding of plague-infected rats has been reported on April 7 and 26, May 8 and 28, October 22 and 31, November 2 and 9, 1914, and on January 11, 1915.

Liverpool, England.—In August last there were nine cases of plague in Liverpool, with three deaths.

During the two weeks ended January 30, 1915, 411 rats were examined at Liverpool. No plague-infected rat was found. The total number of rats examined from July 25, 1914, to January 30, 1915, was 5,683. No plague infection was found.

Port Said: A case of plague was notified at Port Said, December 16, 1914.

At Guayaquil, November, 1914, 111 cases, with forty-seven deaths.

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In Java, during the month of October, 1914, as follows:

Districts.	Cases.	Deaths.
Kedru	492	455
Madioen	110	96
Pasoeroean	878	756
Surabaya	181	167
Total	1,661	1,474

Mauritius: During the week ending November 12, 1914, fourteen cases of plague were notified.

Senegal: The port of Dakar was reported plague-infected December 5, 1914.

Shanghai: During the week ended December 5, 1914, 235 rats were examined. Six plague-infected rats were found.

Hongkong: During the last year there have been 2,147 cases of plague, with 2,023 deaths.

In India, between January 4 and October 17, 1914, 270,242 cases of plague were reported, with 226,104 deaths.

The following summary of recommendations towards reducing the number of rats has been published:

1. Protection of our native hawks, owls, and smaller predatory mammals—the natural enemies of rats.

2. Greater cleanliness about stables, markets, grocery stores, warehouses, courts, alleys, and vacant lots in cities and villages, and like care on farms and suburban premises. This includes the storage of waste and garbage in tightly covered vessels, and the prompt disposal of it each day.

3. Care in the construction of buildings and drains, so as not to provide entrance and retreats for rats, and the permanent closing of all rat holes in old houses and cellars.

4. The early threshing and marketing of grains on farms, so that stacks and mows shall not furnish harbourage and food for rats.

5. The removal of outlying straw stacks and piles of trash or lumber that harbour rats in the fields.

6. Ratproofing of warehouses, markets, cribs, stables, and granaries for storage of provisions, seed grain, and feedstuffs.

7. Keeping effective rat dogs, especially on farms and in city warehouses.

8. The systematic destruction of rats, whenever and wherever possible, by (a) trapping, (b) poisoning, and (c) organized hunts.

9. The organization of rat clubs and other societies for systematic warfare against rats.

Smallpox.—It would be shorter to enumerate the countries (if any such there be) in which this disease has not shown itself during the year, than those in which it has. This is an annual condition of things, and it will continue until vaccination and re-vaccination become more general. Cases of it were reported on three incoming vessels at your quarantine station at Grosse Isle in the River St. Lawrence. From the ss. *Canada*, from Liverpool, it was found necessary to land for quarantine of observation, 304 persons, and to vaccinate 896. In the case of the ss. *Montreal*, from Antwerp,

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145 contacts were landed, and 206 vaccinated. In the case of the ss. *Wittkind*, from Rotterdam, 101 contacts were landed, and 719 persons vaccinated. No further cases occurred, and the disease was in each case stamped out at your quarantine.

Typhus Fever.—Except in parts of Russia and the large cities of Europe and Asia this disease has been fairly dormant for nearly half a century.

Since November 19, 1913, cases of typhus fever have been discovered in immigrants arriving at Atlantic ports from Europe. Seven of these cases arrived at Providence from Marseilles and Naples, and twelve at New York quarantine, mainly from southern European ports.

Within recent years it has been demonstrated that typhus fever is spread from man to man by the body louse, and that apparently this is the only way in which it is spread. This makes the control of the disease comparatively simple when it exists in small foci, and its control even in large outbreaks has been rendered not difficult.

During the latter part of February of this year, typhus fever became epidemic in Tokio, Japan, and from March 20 to April 5 there have been notified 1,750 cases. Epidemics of this size have been exceedingly rare during recent years. In the Tokio outbreak the fatality rate has been reported to be approximately 12 per cent. This is of interest as showing the variations in the virulence of the disease. Higher fatality rates have been given in times past, also much lower fatality rates, an illustration of the latter being the absence of fatality in the type which has been present to a limited extent in New York City and undoubtedly in other American cities for a number of years. Reference is made to what is known as Brill's disease, but which is without doubt typhus fever.

Immediately upon the onset of the outbreak in Tokio, the Public Health Service officer stationed there, in co-operation with the American consul, put into operation the United States quarantine regulations as they related to ships clearing and passengers embarking for United States ports. Passengers from infected territory are detained, bathed, and their clothing disinfected. It is possible that occasional cases of the disease may arrive at Pacific ports in spite of these precautions, and they should be watched for.

Writing in the *Journal* on the etiology of typhus fever and its analogue Brill's disease, Dr. Harry Plotz, of New York, states:—

Basing my opinion on some theoretical considerations and on previous investigations, I considered it advisable to search for an anaerobic organism as the etiologic factor in the acute infectious disease of unknown origin which Brill differentiated from typhoid fever. By the use of anaerobic methods in six cases of Brill's disease, I obtained the same organism in five; the case in which the organism was not obtained was investigated only after the crisis. Inasmuch as studies made during the past few years have shown that Brill's disease is probably a mild form of typhus fever, I decided to apply the same methods to the study of the latter. Through the kindness of Dr. Joseph O'Connell, health officer of the port of New York, to whom I am deeply indebted, I was enabled to study six cases of typhus fever at the height of the disease, and from all of these I recovered an organism that appears to be identical with that isolated from the cases of Brill's disease. A large number of control cases was studied, and the organism was absent from each.

The organism is a small, Gram-positive, pleomorphic bacillus, from 0.9 to 1.93 microns in length, the breadth being from one-fifth to three-fifths of the length. It is not acid-fast, has no capsule, and polar bodies can be demonstrated with appropriate methods. The organism, when first isolated, grows only anaerobically, but after a time it can be grown aerobically.

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Complement fixation tests were made by Dr. P. K. Olitsky and myself, using the serum of eight cases of typhus fever and antigens made up from organisms obtained both from cases of Brill's disease and typhus fever. Complement fixation reactions were negative during the course of the disease, but at or after the crisis, fixation was found to be present in varying degrees in six out of eight cases.

The antigen made from the bacillus obtained from the cases of Brill's disease binds the complement in the same manner as the antigen made from the bacillus isolated from the cases of typhus fever. Complement-fixation tests were made in thirty-six control cases with absolutely negative results.

Intraperitoneal inoculation of a pure culture of the organism into guinea-pigs produce a rise of temperature in from twenty-four to forty-eight hours, the temperature remaining high for four or five days, and then dropping by crisis. This corresponds to the reaction seen in guinea-pigs after inoculation with defibrinated blood from typhus fever patients, except that the incubation period is shorter. Serum from a convalescing typhus patient was proved to have bactericidal properties against the organism obtained from Brill's disease and typhus fever.

In a later communication it is proposed to consider the cultural characteristics of the organism, its agglutination reactions, the further results of animal experiments and cross immunity tests. At the same time the results of studies forming a basis for a possible vaccine prophylaxis, and comparative studies of other organisms described by various authors as being found in typhus fever, will be reported.

This disease is now raging in Austria and in Serbia.

Of the contingent of six physicians and twelve nurses sent to Serbia by the American Red Cross Society since the European war began, all except four have contracted typhus, the disease they were combating, according to Dr. M. P. Lane, of New Orleans, a Red Cross physician.

"It is impossible to convey in words the condition of Serbia," said Dr. Lane. "When we arrived we found the country in the grip of an epidemic of recurrent fever, with a high percentage of fatality. Following the recurrent fever came the scourge of typhus, brought into Serbia evidently by Austrian prisoners. The local physicians, reinforced by medical attaches of the various missionary societies, were utterly unable to combat it, and in almost an incredibly short time the disease had spread through the entire country.

"Deaths were so numerous that it was hard to find means to dispose of the bodies, cremation being the only solution of the problem. In one day during the second week in February there were 450 deaths reported from typhus in the city of Nish alone. Over the entire country it is safe to say that not less than two out of every hundred people, including Serbians and prisoners of war, have died, and the death-rate is rapidly increasing."

The Serbians assert that typhus was introduced by Austrian prisoners of war, who were permitted to wander over the country, and infected the population by spreading vermin, which conveyed the germs of the disease.

The deaths from this disease are already said to exceed 50,000; 192 physicians have already perished from it in hospital work in Serbia.

Budapest is also a hotbed of typhus, and in Pryzemysl on the 20th of this month there were stated to be 15,000 cases.

Leprosy.—There are at present in your lazaretto at Tracadie, N.B., sixteen leper patients, seven males and nine females. This is the smallest number for some years past. There were four deaths during the year, and one new patient was admitted. Twelve are of French-Canadian, two of English, one of Icelandic, and one of Russian

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origin. The medical superintendent reports improvement in several cases under the use of the refined form of Chaulmoogra oil.

The two former inmates discharged, apparently cured, in 1912, remain in good health.

From your leper lazaretto at Darcy Island, B.C., the leper reported in my last annual report was deported to China by the Immigration Department on May 13. He had been in Canada fifteen months, and was found up country. The disease only made its appearance several months after his arrival in the Dominion.

In India it is estimated that there must be now at least 250,000 lepers. In Japan it is stated that there are 38,000 families in which leprosy is known to be present. In the United States during the last fifteen years the United States Public Health Service has twice been authorized to make a leprosy survey. In 1902, 278 cases were found. The report of 1912 was practically identical. In Norway, to judge by the following published table, the number of cases shows a steady decrease:—

Years.	Population.	Cases.	Rates per 100,000 population.	Years.	Population.	Cases.	Rates per 100,000 population.
1856.....	1,494,000	2,858	191.3	1905.....	2,315,000	474	20.5
1875.....	1,803,000	1,752	97.2	1906.....	2,330,000	445	19.1
1885.....	1,930,000	1,195	61.9	1907.....	2,345,000	438	18.7
1890.....	1,982,000	960	48.4	1908.....	2,360,000	394	16.7
1895.....	2,063,000	688	33.3	1909.....	2,375,000	360	15.2
1900.....	2,240,000	577	25.8	1910.....	2,390,000	323	13.5

Beri-beri.—There can hardly be any reasonable doubt now that beri-beri and the class of cases of peripheral neuritis to which it belongs is due to some deficiency in the food—call it vitamine or anything else. The fact that the disease has been so completely stamped out of government institutions by substituting slightly milled rice for the old over-polished variety seems clearly to establish this point.

Over two years ago Little described a form of neuritis which is fairly prevalent in Newfoundland and on the coast of Labrador, where many of the natives live on a restricted diet, consisting largely of highly milled white flour. Little, at that time and again later, was of the opinion that the disease was true beri-beri, and more recently Ohler (*Jour. Med. Research*, 1914, xxxi, 239) reports experimental results that bear out Little's conclusions. Ohler fed chickens on various diets over fairly long periods of time, and found that when the food consisted exclusively of white bread, either with or without yeast, hominy, or milled rice, the fowls developed polyneuritis gallinarum in from five to six weeks. On a diet consisting of whole-wheat bread or of wheat grains, or even if cracked corn or wheat was given once a week to birds on the white bread diet, they remained apparently perfectly well, and on autopsy showed none of the signs of the disease. Two birds that were starved for thirty-eight and fifty-six days respectively failed to show typical symptoms or post-mortem findings. It is, of course, not settled that beri-beri and polyneuritis gallinarum are identical diseases, but it would seem that the two conditions are sufficiently alike in their course and etiology to permit of satisfactory conclusions. The evidence certainly seems to point to the fact that white bread as a sole article of diet is undesirable in that it apparently is lacking in the necessary vitamins. It does not, of course, demonstrate that white bread is undesirable when taken in conjunction with other articles of food which will supply the missing vitamins. The evidence has gradually accumulated, and this work has added to it, to prove that beri-beri is definitely one of the "deficiency diseases," and that the question of its complete

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eradication is merely one of the supply of the proper food in the districts in which the disease is prevalent, together with the persuasion of the people (not always an easy matter) to use the food thus supplied.

Enteric Fever.—Facts as to the efficacy of anti-typhoid inoculation accumulate almost daily. Perhaps the most satisfactory statistics with regard to the value of the method are those afforded by the United States Army *Medical Record*, December 28, 1914. As pointed out by Major Russell of the Medical Corps, United States Army, in 1911, it was made compulsory for all recruits in the army. The following figures showed the contrast between the state of affairs in the Spanish War and that in 1911. At Jacksonville, Fla., in the earlier campaign there occurred certainly 1,729 and probably 2,673 cases of typhoid fever, with 248 deaths. The strength of the force was 10,579. At San Antonio, when an American army was concentrated on the Mexican border in 1911, 13,000 men were encamped for about the same length of time as in the Spanish War, and among these there were only two cases of enteric fever, and no deaths, though the disease was actually present in the civil population of San Antonio and the troops were allowed to enter the town freely. According to Major Russell, in the army as a whole a great drop has occurred in the incidence of typhoid fever since inoculation was made compulsory. Reports from France are as favourable as those from this country. For example, during an epidemic of typhoid fever in Avignon, the garrison of the town consisted of 2,053 men, of whom 1,366 were inoculated. Among the unvaccinated soldiers, 155 cases of typhoid fever with 21 deaths occurred, while among the vaccinated there was not a single case. All the soldiers lived under exactly the same conditions. Again, in Eastern Morocco, among 962 vaccinated soldiers there was no case of infection, whereas among the non-vaccinated the morbidity was 38.22 and the mortality 5.51 per 1,000.

In the British Army in India the results of the method have been conspicuously brilliant. There the typhoid rate fell in five years from over 15 to under 5 per 1,000, and the death-rate from over 3 to 0.63 per 1,000. During the year 1910, among about 70,000 men there was a total of 306 cases of enteric fever; 151 of these occurred in the 10,000 who were unprotected, and only 155 in the 60,000 who had been vaccinated. Only 11.2 per cent of the inoculated died, and 16.1 per cent of the uninoculated. It must be borne in mind that members of the white race in India are peculiarly prone to typhoid fever, and that up to recent years this has been one of the main causes of sickness and death.

Figures dealing with the efficacy of anti-typhoid inoculation in the Italian and Japanese armies tend to show that the method has greatly decreased the death-rate and morbidity rate from this cause. The Italian statistics are especially favourable, while the heads of the Japanese Army have found anti-typhoid inoculation of so great preventive value that it has been made compulsory.

A paper in Paris, France, under date January 13, 1915, says:—

The war has demonstrated beyond all question, according to members of the medical commission, the efficaciousness of anti-typhoid vaccination. Most of the members of the active army had been vaccinated before the war, but the reservists and territorials drafted and sent to the front later, had not, and as a result, towards the end of October, a large number of cases of typhoid developed.

The medical commission sent doctors to the firing line, and they vaccinated a whole army corps of 40,000 men.

By the end of December the good results of this treatment became apparent as typhoid had practically disappeared, the only cases remaining being among the men of two regiments which the doctors were unable to reach.

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In the Canadian Pacific Railway camps in the province of Alberta, anti-typhoid vaccination has been extensively carried out of late, under the direction of Dr. H. G. Mackid. The results have been most encouraging, for in 1911, among 5,500 men who were inoculated, two only contracted typhoid, while of 4,500 who had not been treated, 220 fell ill with the disease. In 1913, 8,400 men were vaccinated, and only one case of typhoid occurred amongst them; moreover, it is probable that the man was ill at the time of vaccination. During the same year, among 2,000 men who were not inoculated, seventy-six cases of typhoid occurred.

In Canada also every precaution was taken before the First Canadian Expeditionary Force left its home shores, and at the concentration camp at Valcartier, Que., almost twenty-seven thousand men were inoculated with anti-typhoid serum; this required fifty-four thousand injections, and notwithstanding this large number, the largest on record, there were no cases of severe constitutional reaction nor infected arms.

The vaccination has spread into Spain, Portugal, the Canary Islands, England, Belgium, Denmark, Switzerland, Egypt, Italy, Sicily, Greece, Roumania, Russia, Turkey, in Europe and in Asia; United States, Canada, Colombia, Costa Rica, Ecuador, Guatemala, Venezuela, Brazil, Argentine, and Uruguay.

International Frontier Quarantine.—At the date of my last annual report this inspection was in force, on account of smallpox in Minnesota and Michigan, at Rainy River, Emo, and Fort Frances, and at Sault Ste. Marie. It was raised by you at all four places on May 31, 1914.

Owing to fresh epidemic outbreaks of smallpox in North Dakota and in Minnesota, you instituted international frontier quarantine medical inspection against smallpox at Emo and at Fort Francis, Ont., on December 16, 1914; at Gretna, Man., on December 26, 1914, and at Rainy River, Ont., on January 2, 1915. These four inspections are still being enforced.

Aftermath.—History tells us war is ever accompanied and followed by pestilence. The present war, with its carnage quite unprecedented in the history of the world, is already proving this in spite of the advances of modern sanitary science. Owing to the European war, diseases, notably cholera, plague, and typhus fever, are reported not only to have increased in volume at certain points, especially in Serbia and Greece, but the spread of these diseases has been steady in all directions.

On this account the problem of quarantine at the various ports promises from now on to assume greater importance than ever before. Special apprehension is felt regarding the chances of infection being brought in after the war is over, when immigration doubtless will increase in volume, and will include men and women from all walks of life and from nearly all parts of the European war zone.

In addition, there is the immediate danger of disease being brought by invalided or other soldiers returning from the war zone. In this way two cases of epidemic cerebro-spinal meningitis have already been brought by returning members of the Canadian Overseas Expeditional Forces to your quarantine stations at Sydney and at Halifax.

National Quarantine in United States.—This problem recently has led to the consideration by the authorities of New York and Boston of the question of having the United States Government assume the quarantine function at these ports on account of the fact that they are the gateways not only of the states of New York and Massachusetts, but also of the whole nation. In other words, it is becoming more and more apparent that the prevention of the introduction of quarantinable diseases from foreign ports into the United States is essentially one of the functions of the National Government.

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Of the twenty Governments of the world which are signatories to the International Sanitary Agreement for uniform quarantine rules and administration, the United States is the only one which has not continuous control of all its quarantine stations. It has absolute control, however, in times of crisis, so that the local health officer exercises his authority only at the tolerance of the Federal Government although at the expense of the State Government.

The anomaly of the local (state or city) control of quarantine has almost disappeared from that country, and if the efforts now being made to effect the transfer of the New York station to the United States Public Health Service are successful, the passing of this antiquated and irrational system will positively be assured. Since 1888 the quarantine functions at sixty-six ports of the United States have been transferred to national control. The Boston quarantine is the latest to make the change, and there now remain but three ports where the Public Health Service is not in full control, viz., New York, Baltimore, and Galveston. The question of transfer is being actively considered at all three of these places, and there is no question that if New York leads the way the other two will follow promptly.

Daylight Quarantine Inspection.—In this connection the following letters are of interest, taken from New York papers of April last:—

To the Editor of the New York Times:

In reply to a letter signed by a number of passengers, including myself, in the nature of a protest at the detention of the Hamburg-American Line steamship *Amerika* until the following morning at Quarantine, where we arrived Saturday evening a few minutes after sundown, I received the inclosed letter from the Health Officer, Joseph J. O'Connell, M.D., which I think is a most reasonable answer. Since the other passengers will not otherwise see it, and since I think it expresses so clearly the necessity for such delay under the circumstances, I think it would be a good idea that it should be published in your paper.

GEORGE WHITEFIELD BETTS, Jr.,

New York, April 28, 1914.

STATE OF NEW YORK,
HEALTH OFFICERS DEPARTMENT,
ROSEBANK, N.Y., April 23, 1914.

Mr. GEORGE WHITEFIELD BETTS, Jr.,
165 Broadway, New York City.

MY DEAR SIR,—Governor Glynn has referred to me for reply your letter of April 21, calling his attention to the fact that the steamship *Amerika*, arriving a few minutes after sundown, was not visited and inspected until the following morning, and inclosing for his consideration a protest signed by certain other passengers predicated upon this circumstance.

I thank you very much for having written this letter, as it gives to me an opportunity of clearing up a little confusion which apparently exists in your own mind and in the minds of the other passengers as to the meaning and wisdom of the law which limits the period of visitation and inspection to the hours between sunrise and sunset.

You say that it is a hardship that 350 people should be kept in the bay overnight when arriving before dark. I know it is a hardship, and the gentlemen who were behind the enactment of the public health law of this state undoubtedly knew it would be a hardship. After a transatlantic voyage, even when the weather has been pleasant, there is a yearning to set foot on land, which is impatient of any opposition, and this notwithstanding the quarters

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occupied by the cabin passengers are as comfortable as could be obtained in any first-class hotel. The food is excellent, and the landlocked harbour removes all possible anxiety as to the safety of the ship and its passengers.

The 350 passengers to whom you refer would appear to be the first and second cabin passengers. May I call your attention to the fact that in addition to these there were on board your vessel 977 steerage passengers, who occupied quarters much less luxurious. These steerage passengers are the ones that give sanitary authorities the most concern. Each of them had to be examined for signs of quarantinable disease. Under the most favourable circumstances an adequate examination of a thousand passengers would be difficult to make in less than an hour's time. It was already twilight when the *Amerika* arrived in the harbour. Before the steerage could be mustered it would be dark.

Laymen do not understand what is perfectly well known to all modern sanitary authorities that for the discovery of symptoms of quarantinable disease in the muster of steerage passengers on shipboard, natural light is absolutely necessary. The circumstances at the present time are not the most favourable. Since January 7 of this year this department has removed from in-coming transatlantic lines, eighteen cases of typhus fever, not to mention smallpox and epidemic cerebro-spinal meningitis cases. These cases have not been confined to vessels in the Asiatic or Mediterranean service, but have been encountered on all the great North European lines, even a vessel of the Anchor Line, which leaves Glasgow and touches at Moville only, having been found to carry a case of typhus. In the full light of day the slight rash and congested eyeballs which indicate typhus in its initial stage are difficult enough to discern. By artificial light it would be absolutely impossible to recognize it. Consequently, in dealing with cases such as the one now under discussion it is my duty to weigh the convenience or impatience of cabin passengers against the possibility of introducing to this country epidemic diseases of great violence. The epidemicity of the present typhus visitation is quite marked in countries in which it has gained a foothold. In the week ended April 5, for instance, 1,750 cases, with a death-rate of 12 per cent, were reported from the city of Tokio.

In protecting the public health we must very often interfere with the pleasure of sea-going people, and sometimes even with the profit of steamship companies, but this is never done unnecessarily.

JOSEPH J. O'CONNELL, M.D.,

Health Officer, Port of New York.

I may add that true as these reasons are for the Atlantic ports, they have even more force on the Pacific side owing to the complexion of the Japanese, Chinese, and other Asiatic passengers to be inspected there.

Circulars.—Circular letters were issued from time to time to your different officers, calling their attention to the various matters during the year connected with the appearances of epidemic diseases abroad.

Bulletins, etc., received.—The weekly Public Health Reports of the United States Public Health Service have been regularly received and are of great value, as are also the monthly bulletin from provincial, state, and municipal boards of health in Canada, the United States, and other countries. The bulletins of the International Office of Public Health, Paris, and of the Sleeping Sickness Bureau, London, have been regularly received throughout the year, and in both cases spare copies have been distributed to the provincial boards of health.

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Official Visits, Inspections, etc.—On the 19th June last I left, by your instruction, to inspect on the Atlantic coast. I visited the quarantine station at Grosse Isle, Que.; the Leper Lazaretto at Tracadie, N.B.; the quarantine stations at Chatham and St. John, N.B.; Digby, Halifax, Sydney, and Louisburg, N.S.; Charlottetown and Summerside, P.E.I.; Rimouski, Que.; and made a second inspection at Grosse Isle, Que., in connection with the improvements being carried on there.

Whilst at St. John, N.B., I attended as your delegate the annual meeting of the Canadian Medical Association, held on July 7, 8, 9, and 10.

And at Halifax I similarly attended the annual meeting of the Canadian Association for the Prevention of Tuberculosis on July 13 and 14. At both these meetings many interesting and instructive papers were read, and discussions held.

On August 14, I left for the Pacific coast. I inspected at Vancouver, Victoria, William Head, and Prince Rupert, and the Leper Lazaretto at Darcy Island.

On September 18, I was sent by you to the Grosse Isle station on special service.

On September 24, I was delegated by you to attend the meetings of the International Joint Commission in *re* remedies for the pollution of boundary waters, held at Niagara Falls, September 25; Buffalo, September 26 and 27; Detroit, September 29 and 30; Windsor, October 1; Port Huron, October 2; and Sarnia, October 3.

I had also the honour to represent you at the annual meeting of the American Public Health Association (the United States of America, the Dominion of Canada, the Republic of Mexico, and the Republic of Cuba), held at Jacksonville, Florida, November 30 to December 4, 1914. The attendance was close to 400, and the proceedings full of interest.

Changes in Medical Staff.—At the date of my last annual report, Dr. Hunter had resigned as assistant medical officer and bacteriologist at the quarantine station at William Head, B.C., but he had not yet been replaced. On the 1st of May you appointed Dr. Alfred G. Long to the position. He resigned, by your permission, on June 4, and on June 17, you filled the office by the appointment of Dr. Chester P. Brown, D.P.H.

Dr. A. A. McLellan, quarantine officer at Summerside, P.E.I., died on the 20th instant.

Stations, etc., Grosse Isle, Que.—Vessels inspected at this station and its substation at Rimouski, 436. Persons inspected, 149,598. Admissions to hospital, 502. Diseases: typhus fever, smallpox, scarlet fever, chicken-pox, measles, enteric fever, mumps, erysipelas, diphtheria, and enteritis simulating Asiatic cholera. Deaths in hospital, 8.

Infectious disease was reported on no less than sixty-six incoming vessels.

Two steamships arrived with typhus fever. Three vessels arrived with small-pox. From one, with 896 persons on board, 304 contacts had to be landed for quarantine of observation. From a second, with 206 on board, 125 contacts were landed, and from the third, with 719 on board, 104. Vaccinations performed, 1,821.

The station again suffered from its inadequate hospital accommodation. It is of urgent importance that the building of the new hospital which has been begun be pushed rapidly to its completion.

At the substation of Rimouski, and between it and Grosse Isle, Dr. Lepage inspected twenty-five steamers, carrying 29,651 persons; Dr. Bouillon, twenty-one steamers, with 22,769 persons, and Dr. Lord, twenty-three steamers, with 23,162 persons on board.

Halifax, N.S.—Vessels inspected, 311. Persons inspected, 65,830. Infectious disease was reported on twelve incoming vessels. Admissions to hospital, twenty. Diseases: Measles, scarlet fever, chicken-pox, and epidemic cerebro-spinal meningitis. This last case was an artillery man in transit from Liverpool to Bermuda. He was in a comatose condition when landed at the quarantine station, and died the next day.

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St. John, N.B.—Vessels inspected, 204. Persons inspected, 19,007. Admissions to hospital, nineteen.

A new first-class detention building has been completed. The new water main has been laid across the channel, connecting it with the city watermain at Fort Dufferin, West St. John. This pipe so far has proved very satisfactory.

Since the dredging has been done in the harbour the current and tide-way are much stronger at the station. In rough weather it is very unsafe, and at times impossible to lighter out to the boarding boat, or to attempt to land sick and other passengers from the incoming steamers. The need of a deep-water wharf is very pressingly felt.

Chatham, N.B.—Vessels inspected, 31. Persons inspected, 579. No quarantinable disease.

Digby, N.S.—Vessels inspected, 1. Persons inspected, twenty-six. One case of measles.

Sydney, N.S.—Vessels inspected, 159. Persons inspected, 4,499. No quarantinable disease. At the request of the Militia Department, a soldier of the Canadian contingent, ill with cerebro-spinal meningitis, was admitted to the quarantine hospital. He recovered, and was duly discharged.

Louisburg, N.S.—Vessels inspected, eighty-six. Persons inspected, 2,233. No quarantinable disease.

Charlottetown, P.E.I.—Vessels inspected, six. Persons inspected, 85. No quarantinable disease.

Summerside, P.E.I.—No vessels, and no quarantinable diseases were reported.

William Head, B.C.—Vessels inspected, 154. Persons inspected, 31,751. One case of chicken-pox. During May, Dr. Long acted as assistant medical officer and bacteriologist, and on 17th June, Dr. Chester P. Brown was appointed to the position.

The new first-class detention building has been completed, and several buildings slate-roofed and brick-veneered.

The *C. G. S. Gunhild* was purchased as an additional tender and arrived on April 22.

Victoria, B.C.—Vessels inspected, one. No quarantinable disease.

Vancouver, B.C.—No report received of any vessels inspected, or of any quarantinable disease.

Prince Rupert, B.C.—No quarantinable disease. The protection work around the hospital island has been done, and a site has been cleared for a third-class detention building.

Tracadie Leper Lazaretto, N.B.—Patients at present, sixteen, three less than last year, and the smallest number for years. Twelve are of French-Canadian, two of English, one of Icelandic and one of Russian origin. Deaths during the year, four; new admission, one. Treatment with Chaulmoogra oil in various forms is being continued. It is being now used in muscular injection in a compound of the oil with camphorated oil and resorcin. The antileprol, the purified product of Chaulmoogra oil, introduced by Dr. Bayon, is being tried.

The two patients discharged as apparently cured, or at least freed from the disease, in February and November, 1912, remain in good health.

The devotion and care extended to the patients by the nursing religious sisters continue to be above all praise.

Darcy Island Leper Lazaretto, B.C.—The leper held at this lazaretto was deported to China by the immigration authorities on May 13.

Public Works Health Act.—Your inspector for Eastern Canada under the Act, Mr. C. A. L. Fisher, states that the year has again been an exceptional one in the

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almost complete absence of infectious disease amongst the men employed on the various works of railway, tunnel, and canal construction coming under his inspection. He found the medical service given to be complete, hospital accommodation excellent, and the sleeping quarters and boarding of the men to be fully equal to the very good conditions reported previously. And as a rule, the sanitary condition of the camps was good.

Dr. A. E. Clendenan, your inspector for Western Canada, reports: General health conditions have been unusually good. No contagious diseases of any importance having occurred, except enteric fever, which has been distinctly less severe than for a number of years past. The medical staffs have been kept well up to the requirements of the Act, and on the whole contractors have not been contentious towards suggestions on sanitation.

I have the honour to be, sir,

Your obedient servant,

F. MONTIZAMBERT, M.D.,

Director-General of Public Health.

The Honourable

The Minister of Agriculture,
Ottawa.

APPENDIX No. 2.

(G. E. MARTINEAU, M.D.)

GROSSE ISLE, Que., 31st March, 1915.

SIR,—I have the honour to submit this my annual report as Medical Superintendent of the St. Lawrence Quarantine Service for the year ended March 31, 1915.

Vessels and persons examined.—There were 436 vessels inspected during the season, being a decrease of six as compared with last year. The total number of persons examined was 149,598, being a decrease, as compared with last year, of 143,970. The above numbers of persons and vessels examined include also those of the Rimouski sub-station.

The decrease in the number of vessels and of their personnel is due to the European war, which completely disorganized the shipping of this port.

The personnel of the ships examined was divided as follows:—

First cabin	8,323
Second cabin	35,498
Steerage	54,571
Cattlemen	73
Crews	51,107
Stowaways	26

Vessels carrying passengers were about 40 per cent of the total number of vessels, which is a decided decrease as compared with former years.

Infectious disease was reported on sixty-six different occasions, and the vessels from which these cases were landed included practically all the passenger vessels coming up the river.

Diseases so reported or discovered were: Typhus, smallpox, scarlet fever, chicken-pox, measles, enteric fever, mumps, erysipelas, diphtheria, and enteritis.

On two occasions vessels arrived with passengers who refused vaccination, and these passengers were landed for the usual period of observation.

Deaths during the voyage were reported on fourteen occasions, and were due to: Malnutrition, one; colitis, one; measles, one; erysipelas, one; peritonitis, one; pneumonia, one; lost overboard, four; convulsion, one; cerebral hemorrhage, one; laryngitis, one; diabetic coma, one.

Births were reported on one occasion only, November 14, on *ss. Corinthian*, a male child.

Apart from three vessels having variola and two having typhus fever on board, the *ss. Hanover* from Rotterdam arrived May 29 with a case of enteritis that was very like Asiatic cholera, and this vessel was detained while a bacteriological examination was made.

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Smallpox.—Three vessels arrived at quarantine with cases of smallpox amongst steerage passengers. They were:

VESSEL'S NAME.	From.	Departure.	Arrival.	PASSENGERS AND CREW.				
				2nd Class.	3rd Class.	Crew.	Landed.	Vaccinated.
SS. Canada.	Liverpool ..	May 30....	June 7....	239	395	262	304	896
S. Montreal.....	Antwerp ..	" 27 ...	" 8....	.....	113	93	125	206
S. Wittekind	Rotterdam..	June 8....	" 21....	14	593	112	104	719

These vessels were delayed about nine hours at quarantine for landing exposed passengers, having their hospitals and infected compartments thoroughly disinfected, and everybody on board vaccinated. No other cases having broken out amongst passengers detained under observation, these were released upon the expiration of the fourteen days of quarantine now required for smallpox observation.

Typhus.—Two cases of typhus fever were discovered on the following vessels:

VESSEL'S NAME.	From.	Departure.	Arrival.	PASSENGERS AND CREW.		
				3rd Class.	Crew.	Landed.
SS. Montezuma.....	Antwerp ...	May 20....	June 3 ...	84	93	105
SS. Sanland	Rotterdam..	June 21....	July 2....	482	126	18

The delay caused to these vessels for being thoroughly disinfected and having all exposed passengers landed was about seven hours. No other cases broke out amongst people detained under observation, and they were in consequence released after fourteen days' detention.

Hospital.—Five hundred and two persons have been admitted to the hospital. There were eight deaths due to the following diseases: Scarlet fever, one; measles, one; diphtheria, one; pneumonia, one; diphtheria complicating scarlet fever, one; pneumonia complicating scarlet fever, two; enteric fever, one.

We were compelled, as in the previous years, to use tents where to put sick admitted at the hospital, as we had no sufficient accommodation in the present one to give them.

I may perhaps be permitted to seize that opportunity and ask again that the construction of the new hospital which has been commenced two years ago be completed as soon as possible, as the lack of accommodation in the present one is the cause of many complaints and criticism from the part of people admitted there.

Laboratory Work.—Besides the ordinary experimental work, fifty-one bacteriological examinations have been made as follows:

Diphtheria	8
Typhoid fever	15
Tuberculosis.. . . .	2
Urinalysis	25
Cholera	1

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Rimouski Sub-station.—There was a total of sixty-nine mail steamers inspected by the quarantine officers of this sub-station during the season, and a number of 73,741 persons examined on these vessels as follows:

First cabin	7,176
Second cabin	18,585
Steerage.. . . .	25,346
Crews	22,634

Infectious disease was discovered on eighteen different occasions, and vessels stopped at Grosse Isle to land sick and have their hospitals disinfected. Deaths were reported on four occasions, and births on three occasions.

I visited this advance post during the season, and coming up on mail steamer I had full opportunity to supervise the work of inspection from Rimouski to Grosse Isle. I have found everything expedient and satisfactory.

Circular Letters.—Circulars of warning regarding outbreak of infectious disease have been received from time to time and, in accordance with the instructions contained therein, special attention was given to the vessels coming from these different places. I am glad to be able to report here that not a single case escaped the vigilance of your quarantine officers at this station.

Improvements.—The following works have been commenced or completed during the season:—

- New iron water tank in western division.
- New dynamo shed extension.
- New shed to give shelter to immigrants waiting for disinfection.
- New addition to hospital kitchen.
- New third-class passengers detention building.
- Concrete foundations for the new hospital.

Requirements.—The list of works still required at this station has already been submitted to you; but I may specially mention here the most urgent and important ones, such as I have already done in my previous annual reports:—

- Construction of a new hospital (foundations already completed).
- Extension of wharves.
- New steamer fitted as an ice-breaker.
- Burying of water-pipes under frost line.

The whole respectfully submitted.

I have the honour to be, sir,
Your obedient servant,

G. E. MARTINEAU, M.D.,
Medical Superintendent of the St. Lawrence Quarantine Service.

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APPENDIX No. 3.

N. E. MACKAY, M.D., M.R.S.C.

HALIFAX, N.S., March 31, 1915.

SIR,—I have the honour to submit my annual report for the year ended the 31st March, 1915.

The work at this station during the year just ended was much quieter than it had been in previous years. This was due to the fact that immigration had practically ceased immediately after the declaration of the present war on the 4th of August last.

During the year, 311 vessels were inspected—74 less than the number inspected the previous year—and 65,830 persons classified as follows: Cabin, 2,365; intermediate, 10,064; steerage, 30,439; and forty-six cattlemen; 137,980 less than in the previous year.

Minor quarantinable diseases were found or occurred on the following steamers during the voyage: ss. *Montreal* from Antwerp, April 3, measles; ss. *Andania*, Liverpool, April 5, measles; ss. *Tunisian*, Liverpool, April 7, measles; ss. *Alannia*, Southampton, April 18, measles; ss. *Kursk*, Libau, April 25, scarlet-fever, ss. *Kursk*, Libau, June 6, chicken-pox; ss. *Devinsk*, Libau, June 28, chicken-pox; ss. *Kursk*, Libau, July 18, measles; ss. *Devinsk*, Libau, August 10, measles and diphtheria; ss. *Pretoran*, Liverpool, December 20, scarlet fever; ss. *Corsican*, Liverpool, March 13, scarlet fever.

Diseases other than quarantinable were found on the following steamers: ss. *Arcadia*, Hamburg, pneumonia; ss. *Russia*, Libau, pneumonia; ss. *Aucta*, Fort Antonia, heart disease; ss. *Grampian*, Liverpool, tuberculosis; ss. *Edlington*, Kingston, Jamaica, typhoid fever; ss. *Missanabie*, Liverpool, cerebro-spinal meningitis.

The case of cerebro-spinal meningitis was a military man belonging to the artillery who was in transit from Liverpool to Bermuda. He was taken ill on the 18th of March, three days before the ship arrived in port, but so far as I am able to ascertain no diagnosis was made. On the 22nd of March I performed lumbar-puncture and withdrew two test-tubes full of cerebro-spinal fluid which was cloudy and turbid, and I injected 30 c.c. of Flexner's serum. The man at the time was in a comatose condition. He died the following day, without recovering consciousness. The fluid was examined bacteriologically by my assistant, who found the *Diplococcus meningitidis* of epidemic cerebro-spinal meningitis present.

Twenty patients were admitted to the station hospital during the year for measles, scarlet fever, chicken-pox and epidemic cerebro-spinal meningitis. One death occurred from spinal meningitis.

By permission of the department, and at the request of Mr. J. Scott, Charleston—he guaranteeing to pay all expenses—I attended three cases of small-pox on the steamer *Margaret*, a local coaster. One of the patients died of a virulent type of the disease—*purpura variolosa*.

During the winter the first and second-class detention buildings were occupied by the militia stationed on McNab's and Lawlor's islands.

Alterations were made in the old German hospital in the early winter for quarters for the new hospital orderly, Mr. Robert Thompson, and his family.

All the buildings and plant at the station are in good state of repair, but we need a wash-house in connection with each of the detention buildings, and an ice-house for the use of the station generally. The scarcity of water is a great drawback, and can only be overcome by sinking more surface wells.

All the officials are attending to their duties faithfully and well. All of which is respectfully submitted.

I have the honour to be, sir,

Your obedient servant,

N. E. MACKAY, M.D., M.R.C.S.,

Quarantine Officer.

APPENDIX No. 4.

(R. C. RUDDICK, M.D.)

St. JOHN, N.B., March 31, 1915.

SIR,—I have the honour to submit my annual report of the St. John Quarantine Station, for the year ended March 31, 1915.

There have been 204 vessels inspected at this station this year; this is an increase of thirty-one vessels compared with the previous year.

The total number of persons inspected were 19,007, classified as follows: Cabin, 545; intermediate, 2,050; cattlemen, 233; steerage, 5,559; crew, 10,620.

There were admitted to our hospital during the year, 19 persons; five were detained for non-vaccination.

The following diseases were treated: mumps, chicken-pox, and scarlet fever.

Improvements.—Our new first-class detention building has been completed, and is now occupied by the military officers. The new water main has been laid across the channel, connecting it with the city water main at Fort Dufferin, West St. John. This pipe has so far proved very satisfactory. On account of the militia occupying our different buildings, it has been necessary for us to have had extensive plumbing done. We have also had repairs made to our low-water landing, and our telephone service is much improved.

Requirements.—A low-water wharf is very much needed at this station. Since the dredging has been done in the harbour, the current is much stronger here at the island. In rough weather it is very unsafe, and at times impossible to lighter out to our tug. It is impossible to land the sick at low water by means of the lighter. Our tug can only come to the wharf at high tide, and all other times we have to lighter to and from the tug. The want of the wharf necessitates one of the medical officers to be stationed at St. John for the winter season, so as to board incoming vessels from the quarantine boat, at all times. A new house is needed for the medical superintendent, and the house he now occupies given to the steward. The steward's house was condemned three years ago, and is now not fit for a dwelling house. The sanitary conditions are bad, the house is leaking, and in winter is extremely cold.

The militia is now occupying four of our buildings. On account of the small transatlantic passenger travel this winter, we have not required any of the buildings occupied by the militia.

I have the honour to be, sir,

Your obedient servant,

R. C. RUDDICK, M.D.,

Medical Superintendent, St. John, N.B.

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APPENDIX No. 5.

(J. BAXTER, M.D.)

CHATHAM, March 31, 1915.

SIR,—For the year ended March 31, I beg leave to send in the following report:
 Number of vessels examined, thirty-one, viz., nineteen steamers, three barques, seven
 barquentines, one brigantine, one three-masted schooner. Number of men examined,
 579.

No quarantinable disease.

I have the honour to be, sir,

Your most obedient servant,

J. BAXTER.

APPENDIX No. 6.

(EDWARD DU VERNET, M.D.)

DIGBY, April 3, 1915.

SIR,—I have the honour to submit my report for the quarantine year ended
 March 31, 1915. During that period one vessel, with a crew of twenty-six, was
 inspected at this station, on which was discovered a case of measles.

Owing to business depression and the war, practically no vessels from quarantin-
 able ports entered the Annapolis basin during the year just ended.

I have the honour to be, sir,

Your obedient servant,

E. DUVERNET, M.D.,

Quarantine Officer.

APPENDIX No. 7.

WM. MCK. McLEOD, M.D.

NORTH SYDNEY, C.B., March 31, 1915.

SIR,—I have the honour to forward my report of work at this quarantine station
 for the year ended March 31, 1915.

During the past twelve months there arrived one hundred and fifty-nine ships,
 subject to quarantine inspection, classified as follows, viz.:

Sailing ships	8
Steam ships	151
	<hr/>
Total	159

Number of persons inspected, 4,499.

Happily no quarantinable disease was found. On January 28, you authorized the
 use of one of our buildings by the Department of Militia for treatment of a soldier
 of the Canadian contingent, ill with cerebro-spinal meningitis. He recovered and
 was duly discharged.

I have the honour to be, sir,

Your obedient servant,

WM. MCK. McLEOD, M.D.,

Quarantine Officer.

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APPENDIX No. 8.

D. A. MORRISON, M.D.

LOUISBURG, N.S., April 1, 1915.

SIR,—I have the honour to submit my annual report for the year ended March 31, 1915.

During the year I inspected eighty-six vessels, of which eighty-three were steamships and three were sailing vessels. The crews totalled 2,226, and passengers, seven, making a total of persons inspected, 2,233.

No quarantinable disease was found on any of the ships.

I have the honour to be, sir,

Your obedient servant,

D. A. MORRISON, M. D.,
Quarantine Officer.

APPENDIX No. 9.

PETER CONROY, M.D.

CHARLOTTETOWN, March 31, 1915.

SIR,—I have the honour to submit my report for the year ended March 31, 1915.

There was no quarantinable disease on any vessel inspected at this station during the past year.

There were six inspections of ships from the West Indies and from across the sea.

The number of persons inspected was eighty-five, of whom eighty were crew, and five passengers.

Navigation closed to foreign ships on the 22nd of December. From that date communication with the mainland was kept up by the winter steamers between Georgetown and Pictou.

By consent of the honourable the Minister of Agriculture, the hospital was placed at the disposal of the Marine and Fisheries Department, and was used by them from the 13th day of July till the 3rd day of August, 1914, for the accommodation of a seaman suffering from diphtheria—the Department of Marine bearing all expenses in connection with the case.

On the discharge of the patient, the building was thoroughly disinfected and handed back in good order.

I regret to have to report the death, on the 27th instant, of our boatman, Capt. John Nicholson.

I beg to suggest that in the appointment of a successor, regard be had to the appointee's physical fitness for the work, as well as his freedom from other employments from which he cannot be spared when called upon for continued duty in the quarantine service.

The hospital's requirements are well supplied.

I have the honour to be, sir,

Your obedient servant,

P. CONROY, M.D.,
Inspecting Physician.

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APPENDIX No. 10.

SUMMERSIDE, P.E.I.

There was not any quarantinable disease reported from this station.

Dr. A. A. McLellan, the quarantine officer at this port, died on 20th March, 1915.

APPENDIX No. 11.

(H. RUNDLE NELSON.)

WILLIAM HEAD, March 31, 1915.

SIR,—I have the honour to submit my annual report on the conduct of the William Head Quarantine Station, for the year ended March 31, 1915.

Inspections made during the year:

		Compared with preceding year.	
		Increase.	Decrease.
Vessels.....	154	.....	15
Passengers :—			
Cabin	4,755	.....	1,219
Steerage.....	11,434	.....	4,998
Crews.....	15,538	.....	4,073

The effect of the present war conditions on the shipping is interesting:

	1914-15.	Same period last.
Vessels inspected to outbreak of war on August 4.....	65	62
Vessels inspected from August 4 to December 8, when the German Pacific fleet was sunk off Falklands.....	43	60
Vessels inspected from December 8 to March 31.....	46	47
Total.....	154	169

It will be seen that before the declaration of war, on August 4, we had an increase of three ships over the same period of the previous year. During the next period of activity of the German Pacific fleet, there was a decrease of seventeen ships, and the next period, after the victory off the Falklands, and the sinking of the *Emden*, a decrease of only one ship. The loss in sailings was accounted for in the following manner, and it is noticeable that no ship billed for this port was captured by the enemy.

Since the outbreak of the war, the last C.P.R. liner to call here was drawn from the regular service on August 14, and it was only on March 21 that we again had any C.P.R. vessel to inspect. These boats were all taken into Admiralty service, as also

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one of the Blue Funnel line, on August 4. The Canadian-Australian line is also operating only two vessels instead of three. Allowing for the regular arrival of these vessels, we lost by their absence a total of thirty-five ships, which would have brought our total for the year to an increase of twenty ships over the previous year. A number of colliers, however (seven in all), made their appearance as a result of the war, so that, on the whole, though an increase of twenty may be too high an estimate, I feel sure that we would have shown some considerable increase in our total, as the period before outbreak of war showed to be likely.

Below is a list of persons inspected, other than the passengers and crews of the boats:—

Passage workers	5
Distressed seamen	2
Stowaways	17

A total of one birth, twenty-six deaths, and twenty-four cases of various sickness have been reported at different times throughout the year, as having occurred during voyages.

A case of chickenpox was found on the ss. *Niagara*, which arrived on the 27th April, and all steps were taken to prevent an extension of infection from the case.

During the month of May, Dr. Alfred G. Long acted as assistant medical officer and bacteriologist, and on 17th June, Dr. Chester P. Brown was appointed to fill the position. At the present time he is in Toronto, taking out the necessary work to procure the D.P.H. degree, and should return about the middle of May.

Improvements and new buildings.—The new first-class detention building, of concrete, containing fifty-eight rooms, with accommodation for at least 116 people, has been completed and furnished throughout during the past year.

The assistant medical officer's house has been roofed with slate, and brick veneered, additions have been made to the captain's, chief engineer's, steward's, electrician's, and night watchman's houses.

The laundry and storeroom have also been slate roofed and brick veneered, and an addition made to the storeroom.

The second-class detention building also has been slate roofed and brick veneered.

The C.G.S. *Madge* has had some minor improvements and also a new propellor fitted, which by reducing the revolutions per minute of the engine, and giving a slight increase in speed in miles per hour, should effect some saving in fuel.

The C.G.S. *Gunhild* was purchased as an additional tender and arrived on April 22. She is at present undergoing her annual overhaul.

For the past four months, an additional man has been working as groundsman at the station, having been supplied from the Government Experimental Station at Sidney. He has laid out new lawns, shrubberies, etc., round the new first-class detention building, and also improved the grounds in general by the addition of many trees, flowering shrubs, etc., and the station should in the future be even more beautiful than before.

Darcy Island.—The leper referred to in my last annual report was duly deported on the 13th May, on the Blue Funnel liner *Cyclops*. This man had been in Canada fifteen months, and was found up country, the disease having made its appearance several months after his arrival in the Dominion.

I have the honour to be, sir,

Your obedient servant,

H. RUNDLE NELSON, M.D.,

Medical Superintendent.

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APPENDIX No. 12.

(R. L. FRASER, M.D.)

VICTORIA, B.C., March 31, 1915.

SIR,—I beg to submit my report for the year just ended. Coasting vessels have been exempt from inspection during the year. One deep-sea ship was examined here. No case of infectious or quarantinable disease was found on her.

I have the honour to be, sir,
Your obedient servant,

R. L. FRASER, M.D.,
Quarantine Officer.

APPENDIX No. 13.

(LACHLAN N. MACKECHNIE, M.D.)

VANCOUVER, March 31, 1915.

SIR,—I beg to submit my report for the year just ended.

As coasting vessels are exempt from quarantine regulations, no inspections were made at this port during the year.

I have the honour to be, sir,
Your obedient servant,

L. N. MACKECHNIE, M.D.,
Quarantine Officer.

APPENDIX No. 14.

(H. ERNEST TREMAYNE, M.D.)

PRINCE RUPERT, April 2, 1915.

Dr. F. MONTIZAMBERT,
Director General of Public Health,
Ottawa.

SIR,—I have the honour to make my report for the year ended March 31, 1915. No quarantinable diseases of any kind have arrived at this port.

The site for the third-class detention has been cleared, and plans prepared for the disinfection building. No progress has been made in the matter of water supply for the station.

A much-needed work which was done this spring was the protection work around the Hospital island.

I have the honour to be, sir,
Your obedient servant,

H. ERNEST TREMAYNE,
Quarantine Officer.

APPENDIX No. 15.

(J. A. LANGIS, M.D.)

TRACADIE, N.B., March 31, 1915.

SIR,—I have the honour to submit this, my annual report of the Tracadie Lazaretto, to March 31, 1915.

There are at present sixteen inmates of the institution, seven males and nine females.

There were four deaths during the year, and one new patient was admitted.

Of the inmates, twelve are of French, two of English, one of Icelandic, and one of Russian origin. The ages of the patients vary from eleven to eighty-four years.

Classifying the patients, we have six in the first stage, eight in the second, and two in the third, the final stage.

I have visited the two patients that were sent home three years ago, the disease anaesthetic leprosy, being arrested. They are in perfect health, with not the least spot on them.

The families of a few of our inmates residing in the surrounding parishes I have also visited, and I am pleased to report they are free from the disease.

The treatment followed is with the refined chaulmoogra oil called "antileprol," strychnine, etc., as before. This refined oil, being more digestible, the patients are taking larger doses. It does not impair their digestion in the least, and gives very gratifying results.

One male patient, aged 34, suffering with the maculo-anaesthetic type of leprosy, and whose face was in the condition of fully developed leontiasis, and whose skin was largely infiltrated with nodules and diffused leprous infiltration, is so much improved, his face being only dusky, as to give hopes for his ultimate recovery.

A second patient, male, 42, is able to work from the first month of his taking the oil. He now takes three drachms a day and but for a chronic beratities, which is improving, and two yellow spots on the shoulders, he is on the speedy way to recovery.

A woman patient, aged sixty, an anaesthetic case of leprosy, coming in five months ago, with diseased bones of the hands and feet, and the formation of perforating ulcers on the sole of the feet, has no more open sores after taking this treatment from November last.

With all our inmates who are taking advantage of this treatment, there is a notable improvement and if we cannot cure all, we are doing much in ameliorating their condition.

The few coats of paint, varnish, and general repairs on the inside of the building have added so much to the good appearance of our wards and private rooms, that it seems as if it was healthier, though it is always so trim, clean, and hygienic.

We are expecting for next summer, the repairs at the outside, and our lazaretto will then be more cheerful and present a neat appearance.

Our inmates are truly appreciative to all who are in charge of the institution, and they never let pass an occasion to show their good heart by deeds and sincere thanks.

The good care and kindness the nursing sisters are night and day bestowing on all is a great soothing remedy.

I have the honour to be, sir,

Your obedient servant,

J. A. LANGIS, M.D.,
Medical Superintendent.

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APPENDIX No. 16.

(CHAS. A. L. FISHER, J.P.)

MONTREAL, March 31, 1915.

SIR,—I have the honour to submit this my report for the twelve months ended March 31, 1915, as Public Works (Health) Inspector for the territory from Winnipeg east to the Atlantic ocean.

During that period I have personally visited and inspected all such works (in operation) covered by the Public Works (Health) Act, 1899, as have been brought to my notice.

The term has again been an exceptional one, in the almost non-appearance of contagious and infectious diseases among the men employed on the various public works of the Dominion, coming under my inspection.

I am pleased to be able to report again, that on my several tours of inspection of the public works of the Dominion for the past year, I found the medical service given to be complete, and the sleeping quarters and boarding of the men to be fully equal to the very good conditions in that way reported previously.

The number of public works coming under the regulations of the Act in my territory, have comprised railway and canal construction, and the Canadian Northern Railway tunnel under the mountain at Montreal.

The following is a detailed report of the works I have personally visited and inspected during the past twelve months:

NATIONAL TRANSCONTINENTAL RAILWAY.

This road is being built by the Dominion Government, and at present all the sections between Winnipeg and Moncton, N.B., have almost been completed.

I am pleased to report that on my visits to the works on uncompleted sections I found, as previously, excellent hospital accommodation provided, and duly qualified physicians as district medical supervisors over each section of camps.

With the exception of some cases of typhoid fever, there had been no outbreak of contagious diseases, and the health of the men had been excellent.

I give below the extent and location of the camps, with other particulars of the works carried on by the various sub-contractors.

Superior Junction Section.—From Superior Junction east for 150 miles. This is under contract to Messrs. O'Brien, Fowler & McDougall Bros., who had their headquarters at Superior Junction, Ont., but are now located in Ottawa.

J. E. Joseph, of Pembroke, Ont., is the chief medical officer for the contractors, and J. M. McGrady, M.D., of Port Arthur, is the medical officer in charge of the work.

Superior Junction Camps.—Three gravel pits operated by the contractors and the Pembroke Contracting Company; also a steel gang operated by the chief contractors.

About 400 men were employed, who were located in three camps, and housed and boarded in log and board dwellings by the contractors, and the steel gang in boarding cars.

There were no cases of contagious diseases, and the health of the men and the sanitary conditions were good. There have been a few minor accidents, but no deaths.

One good hospital was maintained on the work, located towards the east end of the contract. G. E. Denison, M.D., was the medical officer in charge, with John Brandon, M.D., as general medical supervisor.

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Missanabie Section.—This is under contract to Messrs. M. P. and J. T. Davis, of Quebec, who have sublet it to Messrs. O'Brien, McDougall & O'Gorman, the contract covering the route from the east end of the Nipigon work, for 150 miles farther east, to the junction of the Abitibi work, under contract to Messrs. E. F. & G. E. Fauquier.

Missanabie Camps.—There were no sub-contractors on this work, and about 300 men employed, who were located in two camps, and housed and boarded in wooden buildings by the contractors. The general health of the men was excellent, and the sanitary condition of the camps was good. There was one hospital on the work in charge of Dr. Kinsey.

A weekly train has been operated on this section, but the work thereon has been closed down for the winter.

Abitibi Section East.—From about 8 miles west of the Abitibi river, crossing easterly for 150 miles. This section is under contract to the Grand Trunk Pacific Construction Company.

About 150 men were employed, who were located along the line in several house cars, and boarded and housed by the contractors.

The general health of the men and the sanitary conditions of the camps were good. One excellent hospital was maintained for these camps located at Peter Brown Creek, within easy access to the construction works. D. R. Cameron was the resident medical officer. This work is now about completed, and bi-weekly trains have been operated thereon throughout the winter.

Ontario and Quebec Section.—From the easterly limit of the Abitibi East section, sublet to Messrs. Foley, Welch and Stewart, to a junction with the Quebec West section at Weymontachi, Que., about 250 miles. This work is under direct contract to Messrs. Macdonnell & O'Brien, and entrance thereto is over their other contracts for the Transcontinental, lately completed by them from Hervey Junction, Que. John McCombe, M.D., is the chief medical officer of the work.

Ontario and Quebec Camps.—Messrs. Macdonnell Co., O'Brien & Martin, Shea & Egan are the subcontractors.

About 900 men were employed, who were located along the line in eight camps, and boarded and lodged in wooden buildings by the subcontractors.

There were no deaths nor cases of contagious disease. The general health of the men and the sanitary conditions of the camps were good. Three hospitals were maintained for these camps; No. 1 being located at Parent, near the east end of the work, and No. 2 located at Peter Brown creek, as convenient as possible for the west camps of the work. D. R. Cameron, M.D., L. M. Dawson, M.D., the late Thomas H. Jackson, M.D., and D. B. Kennedy, M.D., who succeeded him, were the district medical officers on the work. The hospitals and all work on this section have been closed down during the winter.

CANADIAN NORTHERN ONTARIO RAILWAY.

Port Arthur Sudbury Section.—This road is being built by Messrs. Mackenzie, Mann & Co., from Port Arthur to Ruel, Ont., a distance of about 550 miles, and when completed is to form part of the Canadian Northern Transcontinental line from the Pacific to the Atlantic oceans.

Messrs. Foley, Welch & Stewart and the Northern Construction Company are the chief contractors. Messrs. Mackenzie & Mackenzie, M.D.'s, are the chief medical officers of all the work, and have their headquarters at Winnipeg.

There were several subcontractors, and about 2,000 men were employed, who were located along the line in good wooden buildings, and boarding cars, and boarded by the contractors and subcontractors.

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There were no cases of contagious disease, and only one death, and that from an accident. There were three hospitals located along the line, and the St. Joseph's hospital at Port Arthur, and the General hospital at Sudbury, were used when most convenient. These hospitals were under the supervision of C. H. Burroughs, M.D., who made his headquarters at Sudbury, and he had during the year the following medical officers under him, and who made their headquarters at and resided each at one of the three hospitals on the line, viz., E. M. Ellis, M.D., C. P. Young, M.D., E. Evans, M.D., and W. Wellman, M.D. This work was closed down during the winter.

CANADIAN NORTHERN QUEBEC RAILWAY.

Tunnel under Mount Royal.—This is a part of the work in connection with the Canadian Northern transcontinental railway, to give that road a western entrance into the city of Montreal. Messrs. Mackenzie, Mann & Co., of Toronto, are the chief contractors, and Mr. Sidney F. Brown is the chief engineer in charge of the work.

About 350 men are employed, most of whom live in their own homes, and the balance in houses provided by the contractors.

The men are boarded by the Consolidated Boarding and Supply Company, of Montreal. There have been no contagious diseases, and but one fatal accident, and one death resulting therefrom, the man being crushed by a car.

An emergency hospital is maintained at the West Portal camp.

Doctors Mackenzie and Mackenzie, of Winnipeg, are the chief medical officers, and J. A. Charette, M.D., of Montreal, is the medical officer in charge of the men.

CANADIAN NORTHERN WATERWAYS RAILWAY.

Branch of the Canadian Northern Railway from Norwood, Man., running south-east for about sixty miles. The Northern Construction Company, of Winnipeg, are the chief contractors. There are several subcontractors, and about 500 men were employed, who were housed in tents, and boarded by the various subcontractors. There were three slight cases of typhoid fever, but no serious accidents or deaths. The Sisters' hospital at St. Boniface, Man., was used when necessary. Doctors Mackenzie and Mackenzie, of Winnipeg, were the chief medical officers, and C. A. Mackenzie, M.D., was personally visiting the camps and looking after the sanitary condition of the camps and the welfare of the men. This work was closed down during the winter.

WELLAND SHIP CANAL.

This canal is being constructed by the Dominion Government, and the work is divided into nine sections, but up to the present only tenders for five sections have been called for.

Section No. 1.—This has been let to the Dominion Dredging Company, who have their headquarters at Ottawa. Their main camp is located at Port Weller, Ont. About 350 men are employed, who were housed and boarded in frame buildings by the company. There had been one case of typhoid fever and three deaths: one from typhoid, one from drowning, one from electric shock.

The general sanitary conditions were good, and the health of the men excellent. A camp hospital is maintained at Port Weller, under the charge of an hospital ordinary. John McCombe, D.D., is the chief medical officer of this section, and James J. Benny, M.D., is the district medical officer thereon.

Section No. 2.—This is under contract to the firm of Baldry, Yarburgh, and Hutchinson, Limited, of London, England, and St. Catharines, Ont. There are three subcontractors, viz., Yale & Regan, Hill & Leonard, and Stein & Reade, all of

St. Catharines, Ont. About 400 men were employed, who were housed and boarded in frame buildings by the subcontractors. The health of the men has been excellent, there having been no serious disease, but there was one death from drowning, and four from accident. There is a construction hospital at the camp, under the charge of an hospital ordinary. J. McCombe, M.D., is chief medical officer, and Dr. Benny district medical officer thereon.

Section No. 3.—The Confederation Construction Company, Limited, are the contractors for this section, with their headquarters at Thorold, Ont.

About 500 men were employed, who are housed and boarded in frame buildings, by the Harris Abattoir Company.

There were no cases of contagious disease in the camp, but there were two deaths from accident. The sanitary condition of the camp and the general health of the men was excellent.

A camp hospital is maintained at Thorold. under the charge of an hospital ordinary.

John McCombe, M.D., is the chief medical officer, and Dr. Jas. Benny, district medical officer of this section.

Section No. 4.—A small portion of this section has been sublet, and some work done. Only about fifty men were employed, who were housed and boarded by the subcontractor. Their general health was good, and there was no serious disease or deaths. Dr. McCombe is the chief medical officer of the work, and Dr. Benny district medical officer.

Section No. 5.—This is under contract to the Canadian Dredging Company, who have their headquarters at Midland, Ont. Corbett & Son are the subcontractors for the portion of the work now under construction. There are two camps, one at Allanburg, Ont., and one at Port Robinson, Ont. About 300 men were employed, who were housed and boarded in frame buildings by the subcontractors. The sanitary condition of the camps and the general health of the men were good. There were no serious diseases, and no deaths. There were artesian wells at both camps. There was an emergency hospital at the Allanburg camp, and the Welland County General hospital was used when necessary.

Drs. Colbeck and Streight are chief medical officers, and Kirk Colbeck, M.D., looks personally after the welfare of the men, as district medical officer.

On the above public works, in my territory, during the term reported on, there was an average of 6,200 men employed, with seventeen qualified medical officers, in charge of camp hospitals and camps.

Cases of contagious and infectious disease:—

Typhoid fever	4
Deaths and causes as under—	
Typhoid fever	1
Drowning	2
Electric shock	1
Accidents	7
	—
Total deaths as above	11

In closing this report for the twelve months ended March 31, 1915, I am pleased to again be able to draw your attention to the very great abatement of contagious and infectious diseases, the exceptionally low death-rate, the very good sanitary conditions of the camps, the care given by the companies, contractors, subcontractors, and medical officers, in trying to comply with the requirements of the regulations, and the consequent general healthfulness of the men.

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In concluding this report, I beg to again draw your attention to the necessity of amending, with as little delay as possible, the regulations at present applying under the Public Works (Health) Act, 1899.

I have the honour to be, sir,

Your obedient servant,

CHAS. A. L. FISHER,
Public Works Health Inspector.

APPENDIX No. 17.

A. E. CLENDENAN, M.D.

EDMONTON, ALTA., March 31, 1915.

SIR,—I have the honour to submit my report for the year ended March 31, 1915, as inspector for Western Canada under the Public Works Health Act. For reasons that are now historic, the volume of public works has very much decreased during the past year. In addition to unprecedented national causes, a normal shrinkage has occurred through the completion of several contracts, notably the Canadian Pacific irrigation between Calgary and Medicine Hat in Alberta, the main line of the Grand Trunk Pacific between Winnipeg, Man., and Prince Rupert, B.C., and the Canadian Northern laid in skeleton track between Edmonton, Alta., and Vancouver, B.C.

General health conditions have been unusually good, no contagious diseases of any importance having occurred except typhoid, which has been distinctly less severe than for a number of years past. The medical staffs have been kept well up to the requirements of the Act, and, on the whole, contractors have not been contentious toward suggestions on sanitation.

The public works mentioned as follows are all that come under the Act in the four western provinces and are given in the order in which each was visited for first inspection during the year. The lessened volume of work has enabled more frequent inspections to be made than in former years.

1. The Hudson Bay railway is under direct construction by the Dominion Government. It extends from The Pas, Man., to Port Nelson on Hudson bay, a distance of 418 miles. J. D. MacArthur and N. Boyd are the chief contractors. The work has been sublet to McMillan Bros., who in turn sublet to station men, with the exception of a limited number of large camps of their own on some of the heavier stations. Track is now laid over one-third of the distance, and grading is completed to mile 280, which is the first crossing of the Nelson river. On the completed graded portion, track is being laid this winter, and supplies are being put along the right of way for 125 miles to finish the grade to Port Nelson next summer. The two large bridges over the Nelson will delay completion of the contract for two years.

During the winter months, about 800 men were employed in ballasting and freighting, and the number reached 2,550 during the summer. Owing to the great preponderance of station men as compared with large camps, the sanitary conditions were somewhat below par but there was no menace to general health on account of their dissemination. Food supplies can be taken into that part of the country only during the winter, and nothing is yet produced locally along the line. The absence of fresh food, particularly vegetables, gave rise to scurvy, and forty-five cases came under the attention of the medical staff. None were serious, and all made a good recovery. Fresh potatoes and onions were carried in on men's backs for the patients. This is the first instance of scurvy on public works. Doctors Orok and Ross, The Pas, are chief medical officers, and their main base hospital has been at The

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Pas 1. ~~Leir~~ assistants were: Dr. Hogan, in charge of ballasting and pit gangs on the first 100 miles out from The Pas; Dr. N. F. Orok was with the steel gang in a hospital car; Dr. Hughs was at mile 115; Dr. Pedlow at Thicket Portage (mile 185), with a fourth-year student in residence in the hospital assisting; Dr. Holmes had a hospital at Manitou (mile 243) and an advance post emergency hospital at mile 263, with an orderly in residence. There were sixteen cases of typhoid with three deaths, four deaths from other sickness, four fatal accidents, and three serious ones.

2. Grand Trunk Pacific bridge over South Saskatchewan on the Prince Albert branch line, 33 miles southeast of that city, was completed this year. John Gunn and Sons, of Winnipeg, had the contract for the piers, and the Canadian Bridge Co. for the steel work. The force was seventy men, looked after by Dr. Humphries, of Prince Albert. There were no accidents or sickness of any account.

3. Rogers Pass tunnel on the main line of the Canadian Pacific railway is an 8-mile contract, 3 miles of which are approaches to a main tunnel of 5 miles. This is the largest work of its kind in the West, and will take several years to complete. Two gangs, one at the Glacier to the west and the other at Bear Creek to the east, are kept at a strength of 400 men each. Messrs. Foley, Welsh and Stewart are the contractors, and have constructed the best permanent quarters to be found in Western Canada. The natural water facilities were such that modern house improvements have been installed in both camps. Dr. Ker, of Vancouver, is in charge of medical services, and on the ground are Dr. Gallagher with the base hospital at the west portal, and Dr. Davidson with an emergency hospital at the east portal. An engine is used to transport any but minor cases from the emergency to the base hospital. Five cases of typhoid occurred, three deaths from gas and one from falling bank.

4. The Kettle Valley line by the Canadian Pacific Railway was under construction from Princeton to Osprey lake, a distance of 35 miles, and the contractors were Guthrie McDougall & Co., who sublet to Heine & Co., Ivor, Paulson, Blanchard & Co., Alden & Co., Bain & Co., Crooks & Co., Glabin & Bluth. The forces went as high as 800 men, and were attended by Dr. McCaffrey, who used the Princeton General hospital as a base, and kept an emergency hospital on the grade. The camps were very free of sickness. On the same line, work was done from Hope, B.C., to Coquahalla Summit, being a distance of 40 miles. MacArthur Bros. Co., with five camps and 585 men made the grade. In the medical service were Dr. McArthur, with a hospital at mile 3, and Dr. Pettman at mile 32. There occurred two cases of typhoid, one diphtheria, three broken bones, and ten deaths from explosions. This contract was all rock work.

5. The Great Northern Railway, with headquarters in Spokane, Wash., built in British Columbia an extension from Coalmont to Otter Summit, a distance of 25 miles. Guthrie & McDougall were the contractors, and had two subcontractors. There were 520 employees under the care of Dr. McCaffrey at the Princeton General hospital, and an orderly in an emergency hospital on the grade. No serious hospital cases were reported.

6. The Kootenay Central, connecting the Crowsnest line at Fort Steele with the main line at Golden, was completed this year by building from mile 46 to 106. Foley, Welsh & Stewart sublet the work to Burns Jordan & Co., who had 425 men in eight camps. There were in all 400 men on Canadian Pacific force work on the ballasting gangs, pit gangs, and small bridge gangs. The men were attended by the nearest local practitioners, who were Dr. Shaw, of Wilmer, and Dr. Cullum as assistant to Drs. King and Green, of Cranbrook, and Dr. Taylor, of Golden. There was the same absence of sickness that has prevailed for the two previous years, with one death from violence.

7. The C.P.R. land irrigation between Calgary and Medicine Hat was completed this year by Grant, Smith & McDonald building the extensive concrete aqueduct work

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at McBeth Siding, 4 miles east of Brooks, on which there were 400 employees, and by Janse, McDonald & Co., whose subcontractors were Frank Jackson and Dukelow and Son, finishing the ditches with sixty men.

Dr. Anderson, of Brooks, using the Medicine Hat General hospital, furnished the medical service under the supervision of Dr. Ker, of Vancouver, B.C.

One case of typhoid, with recovery, is all that occurred. This work for several years past has shown many cases of typhoid. A falling concrete form killed one man.

8. Thirteen miles was added to the Expanse extension of the Canadian Pacific railway in Saskatchewan by Dutton and Timson, with Richards and Milton as subcontractors. They employed 121 men, who were attended by Dr. W. T. O. Welsh, of Expanse, with a hospital at Expanse. No sickness was reported.

9. The Weyburn-Lethbridge line of the Canadian Pacific Railway was extended 25 miles from Foremost to East, Alta., by G. W. Webster and two small subcontractors, with 114 men.

Dr. Fanner, of Bow Island, Alta., with a hospital in the village, was in attendance. The work was finished without any sickness.

10. Coronation to North-West, in Alberta, was continued by the Canadian Pacific railway for 25 miles. It is a branch of the Lacombe-Kerrobert line. Janse Bros., Boomer and Hughes, sublet the work to John Timothy, who in turn sublet to C. E. Sandine, McMillan & Co., Foley Bros., Holmes, Murray & Sharky; 177 men were employed. They were in charge of Dr. Hurlburt, of Coronation. No cases of any serious illness occurred. The contract was completed in December.

11. The Southern Alberta Land Company, on their irrigation canal and ditches in southern Alberta, had in division B, from Retlaw to South Dam, thirteen camps and 502 men, in charge of Dr. A. V. Brown, of Medicine Hat, with a hospital at Medicine Hat. In division C, from Retlaw to Suffield, the contractors were Noehrein and Mannix, with fifty men. Dr. F. W. Diamond was assistant on the field, and located at Champion, Alta.

No contagious diseases were reported, though typhoid had prevailed in the same section for two years previously. This work ceased when the war began.

12. Canadian Northern Railway main line between Edmonton, Alta., and Vancouver, B.C., was under construction more or less throughout the whole distance, the heaviest work being carried on through the Yellowhead pass and down the North Thompson river, and in short sections west of Kamloops. Through the Yellowhead pass was the Canadian Bridge Company, at Snaring river, Graham's tank gangs at Jasper, Dillon's bridge gang at Lucerne, tracklaying gang at Geikie, T. O'Connor bridge gang at Grant Brook, Palmer Bros., and Henning grade camp at Resplendent, and Hogan's tunnel camp at west end of the pass.

Swanson and Co. came next on proceeding west. Turning south from the Fraser river, for nearly 100 miles, Palmer Bros. and Henning held the contract and sublet to many smaller contractors.

On the North Thompson section was Hogan, Parsons, and Twohey Bros.

West of Kamloops was the steel bridge crews and Canadian Northern "force work" gangs. From Ashcroft west, ballasting and pit gangs and a tracklaying gang were operating. Over 1,000 men were engaged. The skeleton track is now laid throughout, but a great deal of construction work remains before this is a commercial road.

Dr. Robert MacKenzie, of Vancouver, B.C., is the chief surgeon. He had engaged on the work Dr. Nivin, of Jasper, Alta., Dr. Briggs, assisted by Dr. Jardine. were located at the crossing of the North Thompson, Dr. Howell at mile 123 north of Kamloops, Dr. J. H. Wilkinson, Kamloops, and Dr. Stewart Ross at Lytton. All of them had satisfactory hospitals at their headquarters.

There were twenty-six cases of typhoid and five deaths from the same disease on the entire line, and sixteen major accidents, with three deaths. Numerous minor injuries were reported but no other contagious diseases.

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13. The Grand Trunk Pacific between Winnipeg and Prince Rupert was completed this last autumn, and the last sections in the mountains passed from the construction to the operating department of the company. In the month of August there were still in camp on the line between Jasper, in the Rocky Mountains Park, Alberta, and Prince Rupert, B.C., the following camps: Bates and Rogers, seven camps with 235 men; Canada Bridge Co., at west end of Fraser lake, with forty-five men; Collins and Hamilton, with five camps on concrete pier work and 220 men employed; the G.T.P. had seven ballasting and extra gangs, with 320 men.

The doctors in charge were those who are located at what are to be the permanent divisional points, where each had a hospital. The construction medical service was withdrawing from the work and giving place all along the line to the operating service. It consisted of Dr. Nivin, Jasper, Alta.; Dr. Taylor, McBride, B.C.; Dr. Richardson, Prince George, B.C.; Dr. Stone, Endako, B.C.; Dr. McLean, Smithers, B.C.; Dr. Wrinch, Hazelton, B.C.; Dr. Traynor, Terrace, B.C.; Dr. Eggert, Prince Rupert, B.C.

The contagious disease, in the form of typhoid, which had for two years caused so much sickness from Prince George east to Edson, was limited to eight cases, with two deaths; three fatal accidents were recorded, and numerous minor injuries, with three cases of erysipelas, and a small epidemic of mumps. This improved condition has pertained since my last annual report.

14. The Canadian Northern Railway Company worked for two months last autumn on the Medicine Hat to Hanna branch, just north of Redcliffe. Ten miles of ground were broken, and 300 of the settlers in that district were given employment in three camps under the superintendency of Miller and Turnbull, Wilson and Fralick, and Rumbly and Mann. Dr. Brown, of Redcliffe, was the medical man, and had arrangements with the Medicine Hat General hospital. No sickness was reported.

15. The Dominion Western Railway, with a charter from Coutts at the Alberta-Montana boundary to Calgary, Alta., broke ground for the first time this last fall on 6 miles near Pincher Creek under A. Sangreen, with forty men, and 6 miles just south of Calgary under Frank Jackson, with thirty-five men. Arrangements were made by each of the contractors with Pincher Creek and Calgary hospitals to receive and treat any cases of sickness.

16. J. D. McArthur & Co. have carried on continuous construction during the whole year on the Edmonton, Dunvegan and British Columbia railway. Work was on the section between Sawridge at the east end of Lesser Slave lake, on the east, to the Smoky river, on the west, and on the Peace River Crossing branch, which connects with the main line at Round lake. All the grade was let to station men to the number of 500, with the exception of three camps, which were: J. Boynton, with fifteen men on the Peace River branch; A. MacRae, with seventeen men; and Gustafson and Gardner, with seventy-five men, on the main line east of Round lake. There were also a steel gang of 160 men, and ballast and pit gangs of fifty men each, making a total of 867 employees.

Dr. Farquharson, of Edmonton, is chief of the medical service, and keeps on the line Dr. Gibson with a hospital at Sawridge; and Dr. Watson with a final-year student to assist, at Round lake, where a base hospital is located. Selected cases are forwarded to Edmonton.

Numerous cases of dysentery have been reported, and two typhoids, one death from organic heart lesions, one of epilepsy, and two drowned.

Ten thousand two hundred and twenty is approximately the maximum number at work at any one time during the past year on public works in the four western provinces.

Yours obediently,

A. E. CLENDENAN,

Inspector.

MISCELLANEOUS

EXHIBITIONS.

APPENDIX No. 18.

SAN FRANCISCO, CAL., April 1, 1915.

SIR,—I have the honour to submit the following report of the operations of the Exhibition Branch of your department for the fiscal year ended March 31, 1915.

From the 1st of April, 1914, until the opening of the Panama Pacific International Exposition, this Commission was engaged in the general work of preparing our participation at the San Francisco fair.

In view of the magnitude of the exposition, and considering the benefit that Canada would derive from an extensive and striking display of her resources, it was thought advisable to erect a building of impressive dimensions and corresponding architectural value, and to increase in the necessary measure our already very important stock of exhibits with new and fresh specimens of the products of the country.

The space allotted to us in the exhibition grounds consists of about 2 acres of land, situated in the area reserved for the palaces of foreign countries and the different states of the American Republic. As this land is made from sand pumped from the adjacent ocean, we were obliged, in order to secure proper foundations, to make use of a large number of piles, and it was also thought necessary, in view of possible earthquakes, to make an unusually strong framework. The building is 330 feet long by 210 feet wide and, with its lateral projections, covers an area of 70,000 square feet. Over two million feet of lumber were employed in its construction. The outside walls are made of an imitation of Italian travertine, which is the material adopted by the Exposition for its general building scheme. Each one of the four faces of the building presents an imposing appearance, which is heightened by huge bronze replicas of the famous lions of Trafalgar Square, adorning the main entrances. The whole edifice is a fine example of neo-Greek architecture.

The internal decoration is, for the greatest part, made of tableaux executed in Canadian grains and grasses, and representing miniature landscapes or scenes of agricultural life in Canada. These have been treated in a very happy manner, and this special style of decoration, which has the merit of uniting practical advertising to ornamental art, is highly commented upon by every one, and no doubt accounts for a good share of the popularity and success of our section.

The Canadian exhibit is composed entirely of the natural products of the country, including agriculture, horticulture, forestry, minerals, fish and game. The water-power section consists especially of a huge coloured panoramic map of Canada and a number of models of power plants supplying the main commercial and industrial centres from coast to coast. The main centres are shown on the map, red cards indicating the localities of some of the larger developed water-powers, and green cards some of the larger power sites as yet undeveloped. A large panorama called "Past and Present" illustrates the march of progress and civilization in Canada. The transportation facilities by railroad and water for the carrying and care of the great Canadian wheat crop, and the easy grades of the Canadian railroads through the Rocky Mountains, in comparison with those of the American railroads, are prominently advertised. Special attention is called to the new route via the Panama Canal,

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by which the farmers of Alberta and part of Saskatchewan will be able to ship their grain after navigation is closed in the East. The large panoramas used in connection with these sections required about 500 feet of cloth. A special exhibit of Canadian agricultural grasses has also been scientifically arranged, and includes 180 varieties. Literature, issued by the Federal and Provincial Governments, is given to the public, and the officers of our information bureau are kept constantly busy.

We had started as early as the summer of 1913 to prepare a large quantity of bottled fruit in order to enable us to make a first-class display in this line at San Francisco. This fruit was for the most part prepared in the Niagara district of Ontario and in British Columbia during the years of 1913 and 1914. We also have on exhibit a large quantity of fresh apples, collected in the five apple-producing provinces of Canada. I am glad to report that all the work in connection with this exhibit has been carried out most successfully, and that our fruit section here may well be termed unique.

Our mineralogists were also actively engaged during the whole year of 1914 in collecting new specimens of ores from different mining locations, and I may say that our mineral exhibit is one of the most complete and comprehensive ever shown. It is arranged in a very practical manner, each specimen being classified and the place of its production mentioned.

Notwithstanding delays caused by the rainy season, we were able to complete our building even before the time specified, and it was opened to visitors a couple of weeks before the date fixed for the official opening of the exposition, which took place on the 20th of February last. Since then the Canadian Pavilion has been visited by hundreds of thousands of people, and our methods of exhibiting have appealed so strongly to the California people that already steps are being taken to adopt them at future expositions. The comments of the newspapers and other publications are most complimentary, and Canada has received here an enormous publicity. I beg to quote extracts of a few newspaper articles:—

The *San Francisco Chronicle*, February 24, 1915: "We want to have people asking, not 'Have you seen the Canadian exhibit?' but 'Have you seen the California exhibit?'" said Frank L. Brown, Exposition director. The Canadian plan is the one we must adopt, said W. J. Dutton, one of the exposition stockholders trustee.

"It was decided to call a meeting of the different county commissioners and of the representatives of the Chambers of Commerce to discuss the proper measures to be taken for the establishment of a permanent State Exhibition Commission to represent all of California at every exposition worth while to be taken up.

"It was suggested that William Hutchison, the Canadian Commissioner, be invited to address the meeting and tell how his Government worked out its present plan. The Canadian Commission own its own exhibits, which represent Canada as a whole, and takes them everywhere."

The *Palo Alto Times*, March 26: "A valuable lesson for the future will be learned by observing the magnificent success of Canada, and following her plan. Every just and generous Californian will feel like taking off his hat in honour of the success of Canada. Her display is one of the main attractions of the grounds."

The *Chronicle*, January 31: "Canada has a little the best of the other national exhibitors at the Exposition in that it maintains a permanent Government Exhibition Commission. The result is that the Canadian Commission has an established policy experience, and a fund of exhibits always ready to

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show anywhere and at any time. The Commission plays no favourites, and gives place to all the industries and regions of the Dominion, but does no advertising of localities. The Canadian Government makes an exhibit wherever the importance of the occasion and the magnitude of the attendance expected makes it worth while. Practice makes perfect, and to-day Canada stands conspicuously for the effectiveness and artistic finish of her exhibit palace and interior displays. Canada is among the countries whose displays are an artistically aggressive assertion of the sense of national pride."

The *Sacramento Bee*, March 3: "Californians who visit the Panama Pacific Exposition are invited to comment the far-away pre-eminence of the Canadian exhibit."

The *Orville Register*, March 12: "Every local booster in California ought to visit the Canadian building at the Exposition if for nothing but for a visible demonstration that the best local advertising is that which does not advertise the locality at all. Simply as an exploitation of the country and its resources, this Canadian building is incomparably the most skilfully presented exhibit on the grounds."

To sum up, I may say there is no doubt that our participation at this exposition is a splendid advertisement for Canada, and that she will derive a great benefit from it. I am satisfied that our exhibit will have the effect of not only inducing a large number of Americans to settle in Canada, but also of bringing back to our country a great many Canadians now living in the United States.

The whole respectfully submitted.

WM. HUTCHISON,
Canadian Exhibition Commissioner.

APPENDIX No. 19.

IMPORTATION OF DOGS ORDER OF 1914.
(9290)

ORDER OF THE BOARD OF AGRICULTURE AND FISHERIES.
(Dated 23rd October, 1914.)

IMPORTATION OF DOGS ORDER OF 1914.

The Board of Agriculture and Fisheries, by virtue and in exercise of the powers vested in them under the Diseases of Animals Acts, 1894 to 1914, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as followed:

Restriction on Importation of Dogs.

1.—(1) An imported dog, that is to say, a dog brought to Great Britain from any other country, except Ireland, and the Channel Islands, and the Isle of Man, shall not be landed in Great Britain unless its landing is authorized by a license of the board previously obtained, and when landed it shall be subject to the provisions of this order, and to the conditions inserted in any license authorising its landing.

(2) The provisions of this order shall also apply to a dog taken from Great Britain, Ireland, the Channel Islands, or the Isle of Man into any port in any country (except Great Britain, Ireland, the Channel Islands or the Isle of Man), as if the animal were an imported animal, unless it is shown to the satisfaction of the board that the

animal has not been landed in that country and that while on board it has not been allowed to come into contact with any dog or other canine animal from that country, and unless the landing of the animal in Great Britain is authorized by a license of the board previously obtained.

Detention and Isolation of Imported Dogs.

2.—(1) An imported dog shall, for a period of four calendar months after its landing, be detained and isolated at the expense of its owner upon premises in the occupation, or under the control, of a veterinary surgeon, which shall have been previously approved in writing by the board for that purpose, and such premises are in this order referred to as the “place of detention.”

(2) During the said period the dog shall not be moved from the place of detention except to another place of detention or to a vessel for exportation, and in either case only with a license of the board authorizing such movement.

(3) This article shall apply to (a) an imported dog which is shown to the satisfaction of the board to be a bona fide performing dog or (b) an imported dog which is intended to be exported from Great Britain within forty-eight hours after its landing, only so far as its provisions are applied by way of conditions inserted in the license authorizing the landing of the dog.

Conditions of License.

3. The Board may insert in any license granted by them under this order authorizing the landing of an imported dog such conditions as they think necessary or desirable for the following purposes:—

(i) for prescribing and regulating the detention and isolation of the dog so far as the same is not prescribed and regulated by this order;

(ii) for prescribing the person by whom and the premises on which the dog shall be detained and isolated;

(iii) for regulating the movement of the dog to the place of detention, or vessel for exportation, and for prohibiting or regulating its movement during a period of four calendar months after its landing, or until its exportation, as the case may be;

(iv) for prescribing the confinement of the dog in a suitable hamper, crate, box or other receptacle during the movement of the dog by railway, or along a highway or thoroughfare;

(v) for prescribing the mode of isolation of the dog;

(vi) for prescribing the muzzling of the dog;

(vii) for prescribing the notice to be given of the death or loss of the dog, or of any matter arising in connection with the movement, detention, or isolation of the dog and the persons by whom and to whom the notice is to be given; and

(viii) for prescribing the production of a license for inspection by an officer of the board, or police constable, or officer of customs and exercise.

Notice of Detention in case of Illegal Landing.

4.—(1) Where an inspector or other officer of the board, or of a local authority, has reason to believe that a dog has been landed in contravention of this order or of any order hereby revoked, he may give notice to the owner or person in charge of the dog requiring that, within a time specified in such notice, the dog shall be moved (a) to a vessel for exportation, or (b) to a place of detention for the purpose of detention and isolation in accordance with the provisions of such notice.

(2) Such provisions may be inserted in the notice as the board may think necessary or desirable for any of the purposes mentioned in the preceding article.

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(3) The operation of a notice under this article may be terminated by notice to that effect given by an inspector or other officer of the board or of the local authority to the owner or person in charge of the dog, on proof to the satisfaction of the inspector or officer that the dog was not landed in contravention of the said orders, or that four calendar months have expired since its landing.

(4) If the owner or person in charge of the dog, after receipt of such notice, fails to move the dog as required by the notice, he shall be deemed guilty of an offence against the Act of 1894.

5.—(1) If an imported dog is not detained and isolated in conformity with the provisions of this order or of the conditions or provisions of a license or notice issued thereunder, the board, or an inspector or other officer of the board may give notice to such owner or person in charge, requiring him to move the dog to a vessel for exportation within a time specified in such notice.

(2) If the owner or person in charge of the dog, after receipt of such notice, fails to move the dog as required by the notice, he shall be deemed guilty of an offence against the Act of 1894.

Seizure of Dogs in case of Default.

6.—(1) If an imported dog is not detained and isolated as required by this order or by the conditions or provisions of any license or notice thereunder, an inspector of the board may seize the dog, and thereupon the board shall detain and isolate it at the place of detention specified in the license or notice, or any other place of detention selected by them, in accordance with the requirements of this order or the said conditions or provisions, at the expense of the owner of the dog.

(2) If the owner of the dog does not, within ten days after the expiration of the period of detention specified in this order or in the license or notice, claim the said dog from the board and pay them their expenses of detaining and isolating the dog, the board may destroy or otherwise dispose of the dog as they think expedient.

Re-landing prohibited of Imported Dogs moved to Vessels for Exportation.

7. An imported dog which has been moved to a vessel for exportation in accordance with a license or notice under this order shall not be re-landed in Great Britain without a license of the board authorizing such landing.

Regulation of Transhipment of Imported Dogs.

8. An imported dog shall not be transhipped in a port in Great Britain except with the written permission of an officer of the board or of an officer of Customs and Excise.

Proceedings under Customs Acts for Unlawful Landing.

9.—(1) If any person lands or attempts to land a dog in contravention of this order, he shall be liable, under and according to the Customs Acts, to the penalties imposed on persons importing or attempting to import goods the importation whereof is prohibited by or under the Customs Acts, without prejudice to any proceedings against him under the Act of 1894 for an offence against that Act.

(2) The dog in respect whereof the offence is committed shall be forfeited under and according to the Customs Acts in like manner as goods the importation whereof is prohibited by or under the Customs Acts.

Detention of Dogs on Vessels in Port.

10.—(1) Every dog to which this article applies shall at all times while on board a vessel in any port in Great Britain be—

(a) secured to some part of the vessel by a collar and chain and muzzled with a wire cage muzzle, so constructed as to render it impossible for such dog while wearing the same to bite any person or animal, but not so as to prevent such dog from breathing freely or lapping water; or

(b) confined in an enclosed part of the vessel from which the dog cannot escape.

(2) If any dog to which this article applies shall die, or be lost from a vessel, in any port in Great Britain, the person in charge of the dog shall forthwith give notice of such death or loss to the board.

(3) The provisions of this article shall apply to every imported dog which is not accompanied by a license issued by the board authorizing the landing of such dog in Great Britain.

Extension of certain Sections of Diseases of Animals Act, 1894.

11. Dogs shall be animals, and rabies shall be a disease, for the purposes of the following sections of the Act of 1894 (namely):—

Section forty-three (*Police*);

Section forty-four (*General Administrative Provisions*);

Section fifty-six (*Proceedings under Customs Acts for unlawful landing or shipping*);

and also for the purposes of all other sections of the said Act containing provisions relative to or consequent on the provisions of those sections and this order, including such sections as to relate to offences and legal proceedings.

Local Authority to Enforce Order.

12. The provisions of this order, except where it is otherwise provided, shall be executed and enforced by the local authority.

Offences.

13.—(1) If a dog is landed or transhipped in contravention of this order, the owner and the charterer and the master of the vessel from which it is landed or transhipped, and the owner of the dog, and the person causing, directing, or permitting the landing or transshipment, and the person landing or transshipping the same, and the consignee or other person receiving or keeping it knowing it to have been landed or transhipped in contravention as aforesaid, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Acts of 1914.

(2) If a dog is moved in contravention of this order, or of the conditions or provisions of a license or notice thereunder, the owner of the dog, and the person for the time being in charge thereof, and the person causing, directing, or permitting the movement, and the person moving the dog, and the consignee or other person receiving or keeping it knowing it to have been moved in contravention as aforesaid, and the occupier of the place from which the dog is moved, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(3) If a dog is not kept isolated as required by this order, or by the conditions or provisions of a license or notice thereunder, the owner of the dog, and the person for the time being in charge thereof, and the occupier of the place where such dog is detained, and the person failing or neglecting to isolate the dog, shall, each according to and in respect of his own acts, defaults or omissions, be deemed guilty of an offence against the Act of 1894.

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(4) If a dog is not secured, muzzled, or confined as required by this order, or by the conditions or provisions of a license or notice thereunder, the owner of the dog, and the person for the time being in charge thereof, and the master of any vessel on board which the dog is or has been carried to Great Britain, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

Withdrawal of License in cases of Default.

(5) If a person with a view unlawfully to evade or defeat the operation of this order, or of the conditions or provisions of a license or notice thereunder, allows a dog to stray, he shall be deemed guilty of an offense against the Act of 1894.

(6) If the owner or person in charge of a dog fails to give, produce, or do any notice, license, or thing which by this order, or by the conditions or provisions of a license or notice thereunder, he is required to give, produce, or do, he shall be deemed guilty of an offense against the Act of 1894.

Revocation of Order; Existing Licenses.

14.—(1) The Importation of Dogs Order of 1901 is hereby revoked.

(2) A license granted or notice given under the order hereby revoked shall have effect as if it had been granted or given under this order, and may be enforced accordingly; but any such license or notice shall, as from the commencement of this order, be read and have effect as if the period of detention referred to therein were four calendar months instead of six calendar months.

Interpretation.

15. In this order, unless the context otherwise requires,—

“The Board” means the Board of Agriculture and Fisheries;

“The Act of 1894” means the Diseases of Animals Act, 1894;

“Master” includes a person having the charge or command of a vessel:

Other terms have the same meaning as in the Act of 1894.

Commencement.

16. This order shall come into operation on the first day of November, nineteen hundred and fourteen.

Short Title.

17. This order may be cited as the IMPORTATION OF DOGS ORDER OF 1914.

In witness whereof, the Board of Agriculture and Fisheries have hereunto set
[L.S.] their official seal, this twenty-third day of October, nineteen hundred and fourteen.

SYDNEY OLIVIER,

Secretary.

